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ARTICLE XXVI.—*Notes on Ipecacuanha. By R. Eglesfeld Griffith, M.D. &c.*

THE following notes upon one of the most important vegetable articles of the materia medica, may not perhaps prove uninteresting to such of our readers as have not access to the later works on pharmacology; they have, for the most part, been derived from a paper by Richard in the Dictionnaire des Drogues, and a Memoir by Dr Martius on the medicinal plants of Brazil; from the latter of which we have likewise given representations of the various roots known under the title of Ipecacuanha.

The first account of this article was given by Margrave and Piso in their natural history of Brazil about the year 1648. They speak in the highest terms of it, stating that it possesses emetic qualities, and was considered in its native country to be a specific in diseases of the bowels. Unfortunately, however, the description they gave of the plant

furnishing it, was so imperfect, that it was impossible to identify it. Notwithstanding the eulogy bestowed on it by these writers, it does not appear to have been introduced into Europe until 1672, when a French physician, named Legras, brought a quantity of it from America, and sold it under the names of *Beconquille* and *Mine d'or*. From having been improperly administered, it soon lost the high character with which it had been invested by Piso and others. In 1686, however, the experiments of Helvetius, and the extraordinary success attending his administration of it in bowel complaints, again attracted the attention of the learned towards it, and it soon became established as one of the most valuable additions to the materia medica.

It may be remarked as a curious fact in the history of medicines, that our best remedies have in a vast number of instances met with strenuous opposition and neglect on their introduction, and have been more indebted for their general adoption to fashion, or to some adventitious circumstance, than to a well-grounded conviction of their utility and value. Thus Helvetius obtained his knowledge of the virtues of Ipecacuanha by mere accident. He was a student at Paris, and accompanied a physician by the name of Afforty to visit a merchant named Grenier; the latter recovered his health, and, to testify his gratitude, made Afforty a present of a portion of a new and valuable remedy against the dysentery, which had been sent him from South America. Afforty attached but little importance to the gift, and transferred it to Helvetius, who immediately experimented with it, on several persons affected with bowel complaints, and was eminently successful. Finding that the virtues of the article had not been exaggerated, he published to the world that he was in possession of a certain remedy against diseases of the bowels, carefully concealing, however, the nature of his means. But several of the attendants on Louis XIV. and finally the dauphin himself, being attacked with the prevailing disorder, the king ordered an arrangement to be entered into with Helvetius for the promulgation of his secret, in

consequence of which, the use of this drug soon spread throughout Europe, where it received the highest praise, even from the most incredulous.

The increasing value of Ipecacuanha now attracted the attention of adventurers to the new world, and they inundated Europe with a strange medley of roots, possessing various properties, and derived from plants of the most opposite characters, till the term Ipecacuanha became a general designation for all roots of American origin endowed with emetic qualities.

Until the time of Linnæus, it was generally asserted that the true Ipecacuanha was furnished by a species of violet. About the year 1724, however, the celebrated Mutis, then travelling in New Granada (Colombia), sent to the Swedish naturalist an account of the plant which he supposed to have been referred to by Piso. A description of this was published by the younger Linnæus, in the supplement to the *Species Plantarum*, under the name of *Psychotria emetica*. Its history remained in this unsatisfactory state until the beginning of the present century, when Brotero, professor of Botany at Coimbra, designated the real origin of this useful root. He described and figured the plant furnishing it in the Transactions of the Linnean Society of London, under the name of *Callicocca ipecacuanha*. Notwithstanding this, considerable confusion still existed as regarded other roots, also derived from Brazil, and bearing the same name. In 1802, Decandolle published a memoir, showing incontestably, that the Ipecacuanhas of commerce were not only derived from the two plants described by Mutis and Brotero, but also from a great number of others, belonging to different and widely separated genera. This has since been ably corroborated by Auguste St Hilaire in his work on the plants of Brazil, and by the authors first quoted.

The Ipecacuanhas of commerce may be divided into two great classes, the *annulated* or true Ipecacuanha, and the *striated* or false; this commercial distinction has also the advantage of agreeing perfectly with the botanical differences

between the plants furnishing them. The characters drawn from the colour are subject to so many variations, that they cannot be depended upon; they however may serve to mark the varieties. In this country, notwithstanding our constant communication with Brazil, very little of the false Ipecacuanha is offered for sale.

Annulated Ipecacuanha.

Cephœlis, Swartz.

Swartz. Flor. ind. occ. 1, p. 435. Juss. in Mem. Mus. 1820, p. 402. *Callicocca*, Schreb. Gen. p. 126.

Pentandria monogynia. L. Syst. sex. Familia. Rubiaceæ, Juss.

Involucrum bipartite, containing many bracteated flowers. Proper calyx, small, 5-fid.

Corolla, unfundibuliform, 5-fid. Anthers 5, subsessile included. Fruit, ovate, bilocular, containing two seeds.

C. Ipecacuanha.—Root annulated; stem subsarmentose, ascending; leaves oblong, ovate, scabrous above, pubescent beneath, stipules setaceous; flowers in axillary and terminal capituli, peduncles solitary, reflected.

Ipecacuanha. Piso, Bras. edit. 1648, p. 101. Margrav. Bras. ed. 1648, p. 17.

Callicocca ipecacuanha. Brotero, Trans. Lin. Soc. vi. p. 137. Gomez, Mem. sobre a Ipecacuanha fusca do Brazil, &c. Lisb. 1801.

Cephœlis ipecacuanha. Richard, Bull. de la Facul. de Med. 1818, IV. p. 92. Dict. des Drogues, III. p. 256. Merat, Dict. des Sci. Med. XXVI. Virey, Journ. Comp. du Dict. des Sci. Med. VI. p. 335. Humboldt, Gen. III. p. 276. Martius, Specimen, Mat. Med. Bras. p. 4.

Description.—Root perennial, simple, and divided into a few divergent branches, flexuose, twisted, entering the earth obliquely, from four to six inches long, about the thickness of a goose quill, much attenuated towards the base and apex, annulated; epidermis glabrous, of a pale fuscous in the re-

cent root, and umber or blackish brown in the dry; the cortex or parenchyma, soft, white and sub-amylaceous in the fresh root, and pale reddish or rose coloured in the dried state, of a shining and resinous fracture, and readily separated from the thin central ligneous fibre. *Stem* suffruticose, from two to three feet long, every where nodose, sending off roots at the knots. *Leaves* four to six, rarely more, oblong ovate, petiolate; leaves at the summit of the stem opposite, those towards the base alternate. *Stipules* erect, adpressed, four to six cleft, deciduous. *Flowers* in a semiglobose capitulum, surrounded by an involucrum. *Calyx* adhering to the ovary, minute, obovate, whitish. *Corolla* white, funnel shaped, 5-fid. *Fruit* ovate, obtuse, at first purple, afterwards violet black, containing two seeds. It flowers in January and February, and ripens its fruit in May.

The genuïne Ipecacuanha is found in moist situations in the thick and shady forests of Brazil, and is most abundant between the 8° and 20° of south latitude. A considerable supply is derived from the valleys of the granite mountains in the provinces of Rio Janeiro and Spirito Santo; it is also gathered in the southern part of the province of Pernambuco. Humboldt mentions that it is cultivated in some parts of South America. That which is exported from St Sebastian is collected in the forests about Cabo Frio, and in the valleys and mountains of Serra do Mar; that sent from Bahia is derived from Comarca dos Ilheos, and the forests on the banks of the Coutas and Peruguacu. Finally, that from Pernambuco is principally found in the district of Alagoas. A small supply is also obtained from the province of St Paul, Maranham, &c.

This drug forms a very valuable export from Brazil. The price in the sea ports varies according to the distance from whence it has been brought. It is principally collected by the Indians, who, during the two months in which it is fit for gathering, leave their villages almost deserted, and dwell in the woods in which it is found; the consequence is (as is the case with the ginseng in the United States,) that it is almost extirpated in many spots formerly abounding in it.

The plants are pulled up, the roots separated from the stem, washed clean, and tied in small parcels for the purpose of drying. They may be collected throughout the year, but this is generally done from January to March, when it is in flower; this militates against its increase, as it gives no opportunity for the seed to ripen. The Indian tribes, called by the Portuguese *Coroados* (crowned), from the singular manner in which they wear their hair, who inhabit the banks of the river Xipoto in the province of Minas, and the adjoining nation or the Puri, furnish the greatest quantity. The Coroados call the plant *Wosaenda*, whilst it is known by the name of *Muschina* among the Puri. The Portuguese term it *Ipecacuanha* or *Picahonda;* in the provinces of Minas and St Paul, however, it goes by the name of *Poaya.*

The Indian tribes, already spoken of, have a tradition that the medicinal virtues of the Ipecacuanha became known to their ancestors through the wild dog of the country (Gaura). Whenever these animals had drank too freely of the brackish and unwholesome water of the maritime lakes or rivers, they were said to vomit themselves by chewing the stalks and root of the Ipecacuanha.

The genuine Ipecacuanha, as imported into this country, is in roots about the size of a goose quill, of an irregularly twisted and contorted shape, and apparently formed of small, unequal, annular rugæ, of about one line in height, separated by narrow interstices. When broken, they present two distinct parts; a thin ligneous axis or centre, and a thick corical layer of a brownish colour and resinous fracture, having an herbaceous, acrid, and somewhat bitter taste, with a slightly nauseous odour. The epidermis of the genuine Ipecacuanhas presents several shades of colour, to which much importance was attached in the early Pharmacopœias; it does not appear, however, that there is any material difference in the chemical or medicinal qualities of these varieties, these differences arising, according to Dr Martius, from the respective age of the roots or the mode of drying. As these varieties are spoken of in most of our pharmacological works, a few observations on them may not be superfluous.

1. Brown Ipecacuanha. (*Fig.* 1.) This variety, which is also sometimes termed black, is the *Ipecacuanha annelé brun*, Richard; *Ipecacuanha gris ou annelé*, Merat; and the *Ipecacuanha annelé gris noiratre*, Guibourt. This is by far the most common, and is endowed in the highest degree with the peculiar properties for which the drug is valued. Its epidermis is of a more or less dark brown, sometimes even black; its fracture is resinous and of a gray or brownish colour. Martius states that in this variety, the bases of the stalks are frequently gathered with the root; they are about the size of a pigeon's quill, rugose, but not regularly annulated. The brown Ipecacuanha was analysed by Pelletier, under the name of *Psychotria emetica*, with the following results:

	Cortical part.	*Ligneous part.*
Emetine	16	1.15
Fatty matter	2	a trace
Wax	6	
Gum	10	5
Starch	42	20
Extractive matter not emetic	0	2.45
Ligneous fibre	20	66.60
Loss	4	4.80
	100	100

The analysis made by MM. Barruel and Richard, though presenting the same general results, affords some differences worthy of notice, viz.

Emetine	16
Wax, and fatty matter of a different nature	1.2
Resinous matter	1.2
Gum and different salts	2.4
Starch	53
Albuminous animal matter	2.4
Ligneous fibre	12.5
Gallic acid	a trace
	100

The salts found were the sulphate, hydrochlorate and malate of potass, the phosphate and supermalate of lime.

2. Gray Ipecacuanha. (*Fig.* 2.) *Ipecacuanha annelé gris*, Richard; *Ipecacuanha gris blanc*, Merat. This variety is distinguished by its epidermis being of a grayish white colour; the rings are wider apart, the fracture is more resinous, and it is more bitter than the preceding. This is supposed by Martius to be the roots of specimens growing in moist situations, and which have been rapidly dried. It is extremely rare, not more than a dozen specimens being found in a bale.

3. Red Ipecacuanha. *Ipecacuanha annelé rouge*, Richard; *Ipecacuanha gris rouge*, Lemery and Merat. This is annulated like the first variety, but the epidermis is of a brownish red, its fracture is resinous, with a rosaceous tint. It is almost as bitter as No. 2. In most specimens the cortical part is corneous and semi-transparent. Martius observes that "specimens of the *I. brunnea* and *griseo rubens* are sometimes found on the same root, whence it is evident that the colour does not arise from the difference of habitat, as was supposed by Merat, who thought that the former was a native of Brazil, and the latter of Peru.

Pelletier analysed this variety under the name of *Callicocca ipecacuanha:* his results seem to show that it is less active than the brown.

Emetine	14
Fatty matter	2
Gum	16
Starch	18
Woody fibre	48
Loss	2
	100

Besides these varieties of the genuine Ipecacuanha, there are a great number of other roots, sometimes met with in commerce, known under the same name. It will be impossible for us at present to enter on a detailed description of

the whole of them, we shall therefore confine ourselves to such as are found in Brazil, leaving the consideration of the others for a future opportunity.

The most important of the false Ipecacuanhas is the white or striated; this is furnished by the Psychotria emetica, L.

Striated Ipecacuanha.

Psychotria.—L.

Pentandria monogynia, L. Syst. sex. Familia. Rubiaceæ, Juss.

Calyx, 5 toothed, superior. Corolla, tubular. Fruit, globular, containing two hemispherical, furrowed seeds.

P. emetica. Stem herbaceous, procumbent, leaves lanceolate, smooth; stipules setaceous; flowers in capillary capituli, peduncles few flowered.

Ipecacuanha, Mutis. Gomez.

Psychotria emetica, Lin. sup. Humboldt, Bonpland. Gen. Richard. Hist. Ipecac.

Description.—Root perennial, almost horizontal, cylindrical, about the size of the little finger, with here and there narrow, deep depressions. *Stem* somewhat ligneous, simple, about twelve to eighteen inches in height, somewhat pubescent. *Leaves*, opposite, lanceolate, on a short petiole, and furnished with narrow, acute stipules. *Flowers*, white, small, on axillary peduncles.

This plant grows in Colombia, Peru, and probably in other parts of South America. Humboldt found it in great abundance near the Magdalena. It does not, however, appear to be common in Brazil, as Martius was unable to detect any of it among the large quantities sent to Bahia and other Brazilian ports for exportation. It is seldom if ever brought to this country or to Europe, though it enjoys a high reputation in South America.

As found in commerce, it is in cylindrical pieces about the size of a large goose quill, less twisted than those of the true Ipecacuanha, not annulated, but striated longitudinally, and

presenting at intervals, deep circular depressions. Fracture brownish, slightly resinous, scarcely any smell, insipid taste. The epidermis is of a dirty reddish gray, which becomes blackish with age. The cortical part is soft. The ligneous portion is yellowish, and perforated by an infinite number of minute holes. (Fig. 5, 6.)

M. Pelletier has analysed it with the following results:

Emetine	9
Fatty matter	12
Woody fibre, gum, starch, &c.	79
	100

We have adopted the name of striated Ipecacuanha for this root, instead of the more common name of white, as there are a variety of others of the spurious kind which were formerly confounded with it under that designation, these have been ably described and figured by Martius, from whose memoir we have drawn up the following abstract. As from the nature of our work we are unable to give representations of the plants themselves, we have merely added a plate of the roots as they are found in commerce.

Many of these white Ipecacuanhas are derived from different species of the genus Richardia, L. Richardsonia, Kunth.

Richardsonia.

Humb. Gen. III. p. 273. *Richardia*, L. Gen. ed. Schreb. p. 230. Juss. Mem. mus. 1820, p. 372.

Hexandria monogynia, L. Syst. sex. Familia. Rubiaceæ, Juss.

Calyx six to eight parted. Corolla subcylindric, six to eight parted. Stamina six to eight. Capsule three seeded.

R. scabra. Stem prostrate or erect, pilose. Leaves ovate or oblong ovate, attenuated at base, pubescent. Capituli many flowered.

Richardia scabra, L. R. brasiliensis, Gomez.

Richardsonia brasiliensis, VIREY. Journ. comp. dict. med. sci, cum icon. Martius. Spec. mat. med. bras. p. 10.

Description.—Root from four to eight inches long, annulated or subannulated by transverse depressions, and having longitudinal furrows or striæ. Epidermis in the recent root, whitish; in the dry, grayish or pale fulvous, smooth. Cortical part, white, soft, farinaceous, friable, with an acrid and somewhat nauseous taste and smell. Ligneous portion, pale yellow, inodorous and insipid. (Fig. 7.)

There are several other species of Richardsonia also furnishing roots possessing emetic qualities, somewhat resembling the above in appearance. It was for a long time supposed that the white Ipecacuanha was furnished by the *Viola ipecacuanha*, L. alone, but Dr Gomez, in a dissertation published in Lisbon in 1801, proved that much of it was derived from the plants under consideration; this was confirmed by the researches of MM. St Hilaire and Martius in Brazil. M. Guibourt has proposed the name of *undulated* Ipecacuanha for this kind, as it is not really annulated, but presents an undulated appearance, that is, the depression on one side of the root corresponds to an elevation on the other. The emetic properties of the undulated Ipecacuanha are much inferior to those of the genuine kinds, as its analysis by Pelletier demonstrates that the proportion of emetine it contains is very small. This able chemist gives the following as the result of his examination of the cortex.

Emetine	6
Wax and fatty matter	2
Woody fibre	very little

In Brazil, however, it is very highly esteemed on account of its mildness. According to the experiments of Dr J. Gomez in the hospitals of Rio Janeiro, the dose is from one to two drachms, given in the same manner as Ipecacuanha.

The Richardsonia is found throughout Brazil in sandy dry situations, flowering nearly the whole year.

Another of the spurious Ipecacuanhas of Brazil is furnished by some species of the genus Ionidium.

Ionidium.—VENTENAT.

Vent. Malm. p. 27. Humb. Gen. V. p. 291. *Solea*, Spreng. *Pombalia*, Vandelli.

Pentandria monogynia, L. Syst. sex. Violeæ, Juss.

Calyx five leaved. Corolla five petaled, upper petals small, lower large, carinated, unguiculate or sessile. Stamina five, two lower furnished with a gland at base. Capsule subglobose, trigonal, unilocular, many seeded. Seeds with a caruncle.

I. ipecacuanha. Hairy; stem erect, herbaceous; leaves alternate, lanceolate, acutely serrate; peduncles bibracteate, axillary, solitary; calyx glandular, dentate.

Ipecacuanha branca, PISO, Bras. p. 231.

Viola ipecacuanha et V. calceolaria, L. V. Itubu, AUBLET, Guyan t. 313.

Ionidium ipecacuanha, VENT. Malm. p. 23. MARTIUS, Spec. Mat. Med. Bras. p. 14.

Ionidium itubu. HUMB. Gen. V. p. 296.

Pombalia ipecacuanha, VANDELLI. P. itubu, DECANDOL.

Description.—Root perennial, ligneous, perpendicular, four to six inches long, the old roots about the size of the little finger, the younger about that of a goose quill. The older roots are sulcate longitudinally, the younger smooth, both, however, are marked with deep circular grooves. The epidermis is thin, at first of a whitish colour, and afterwards pale fuscous; cortical portion about a line in thickness, of a starch white colour, and has a heavy nauseous smell; its taste is a disagreeable bitter.

This plant grows in sandy and stony situations in various parts of Brazil, flowering from July to September. It is called *Ipecacuanha branca*, i. e. white vomiting root, by the inhabitants, who prize it as highly as the genuine root. Martius states that he saw large bundles dried and suspended

under sheds for medical use in many places. The mode of using it, is to shave the cortical part from the root and infuse it in water for twelve hours; the dose of this infusion is from half a drachm to a drachm. In this way it is said to act mildly but certainly. The analysis of it by Richard, shows that it contains a very small portion of emetine. The result of his examination is:

Emetine containing a little saccharine matter	3.5
Fatty matter	
Starch	54
Extractive matter soluble in water, containing a new crystallisable principle	22
Woody fibre	19
Gallic acid	a trace.

The above comprises the principal roots known under the general name of Ipecacuanha, which have been recognised in the later works on Materia Medica. The following condensed view of these, as well as other species, which we derive from an interesting paper by M. Lemaire-Lisancourt, in the Memoirs of the Royal Academy of Medicine of Paris (Vol. I. p. 450, et seq.) will present our readers with the present state of our knowledge on the subject. At some future period we shall resume the investigation, and lay before our readers a sketch of such indigenous plants as have been used as substitutes for them.

1. White Ipecacuanha of China. *Ionidium heterophyllum*, VENTENAT. *Viola heterophylla*, POIRET. *V. surrecta*, PLUCKENET. Roots slender, tortuous, whitish, nauseous.

2. White Ipecacuanha of the Galipons. *Ionidium hybanthus*, VENT. *Viola hybanthus*, LINN. AUBLET. *Hybanthus scandens*, JACQUIN. Roots white, slender, tortuous, interlaced, of a disagreeable taste and smell. Called *Pira aïa* by the Galipons; and by the Guarinis and other Brazilian nations, *Y cipo ayaca*, or more generally by contraction, *Poaya*.

3. White Ipecacuanha of Guiana. *Ionidium calceolaria*,

Vent. *V. calceolaria*, Linn. *V. itoubu*, Aublet, Jussieu. *Ionidium itoubu*, Kunth. Roots slender, nodose, tubercular, tortuous, more or less branched, longitudinally striated; colour yellowish gray; odour feeble but disagreeable; taste at first mucous, afterwards somewhat acrid and bitter; emetic in gr. xxx doses, purgative in gr. lx.

4. Ipecacuanha of St Thomas. *Ionidium strictum*, Vent. *V. stricta*, Linn. Roots slender, tubercular, grayish, bitter, slightly odorous, &c. This somewhat resembles the genuine Ipecacuanha in appearance.

5. White Ipecacuanha of St Domingo. *Ionidium polygæfolium*, Vent. *V. polygæfolia*. Linn. *V. verticillata*, Cavanilles. Roots fusiform, widely annulated, somewhat fibrous, cylindrical, ligneous, yellowish or grayish; smell disagreeable; taste bitter and acrid.

6. White Ipecacuanha of St Francisco. *Ionidium poaya*, A. St Hilaire. This is called in Brazil *Poaya do campo*. Roots tortuous, white, annulated. Dose twenty-five to thirty grains.

7. White Ipecacuanha of Minas-Geraes. *Ionidium brevicaule*, Martius. Roots sub-oblique, tortuous and flexuose like those of the genuine kind, three or four inches long, slender; epidermis ochraceous, whitish; cortical portion somewhat fibrous, spongy, whitish; taste nauseous. Dose 3ss. to 3i.

8. White Ipecacuanha of Bahia. *Ionidium urticæfolium*, Martius. Roots perpendicular, straight, or a little flexuose, three or four inches long, about the thickness of a quill, epidermis scaly, brown.

9. White Ipecacuanha of Peru. *Ionidium parviflorum*, A. St Hilaire. *V. parviflora*, Mutis. *V. emetica*, Humboldt. Root yellowish or grayish, not large; odour nauseous, &c. (Fig. 3.)

10. White Ipecacuanha of Brazil. *Ionidium indecorum*, A. St Hilaire. Differs from the following in having more tortuous roots or a more marked gray colour.

11. White Ipecacuanha of Brazil. *Ipecucuanha branca*,

Piso. *V. ipecacuanha,* Linn. *Pombalia ipecacuanha,* Vandelli. *Ionidium ipecacuanha,* Ventenet. A. St Hilaire. *Ionidium itubu,* Kunth. *Poaya branca do campo,* Tanny, Jun. *Poaya da praïa* of the natives. We have already described this root (page 192), and mentioned that it is as highly esteemed in its native country as is the genuine kind. (Fig. 8.)

12. White Ipecacuanha of St Paul. *Polygala poaya,* Martius. Root perpendicular, three or four inches long, about the thickness of a quill, widely annulated; epidermis pale yellow, ochraceous, transversely striated; cortical portion white, spongy; taste first sweetish and then bitter. Dose 3i to 3ij. (Fig. 4.)

13. Ipecacuanha of Zoazeiro. *Chiococca anguifuga* and *densifolia,* Martius. *Poaya do sugippe* of the natives. Roots perpendicular or oblique, of the thickness of the finger; epidermis brown, sometimes tubercular; cortical portion tenacious, fibrous; of a peculiar disagreeable acrid fetid smell; taste at first like raw coffee and afterwards acrid, pungent and nauseous.

14. Ipecacuanha of Villa ricca. *Manettia cordifolia,* Martius. Root ligneous, of a dull brown colour, and disagreeable taste and smell.

15. Ipecacuanha of Jamaica. *Spermacoce verticillata,* Linn. Roots slender, striated, undulated, somewhat acrid and bitter. This is a feeble emetic.

16. Rust coloured Ipecacuanha. *Spermacoce ferruginea. Poaya de praia.* Roots about the size of a crow quill, brown, ochraceous. Taste and smell nauseous. Dose from thirty to forty grains.

17. Ipecacuanha de la Serra. *Spermacoce poaya. Poaya do campo.* Roots rather larger than the last, brown without, and white within, of a taste resembling that of true Ipecacuanha, for which it is substituted in some of the provinces of Brazil.

18. Ipecacuanha del Rey. *Richardsonia rosea. Poaya do campo.* Roots tortuous, of the size of a quill, annulated,

white within, and having a violet or blackish epidermis; taste like that of the genuine kind. Dose fifteen to twenty-five grains.

19. Ipecacuanha of St Paul. *Richardsonia emetica*, Martius. Roots five to seven inches in length, slender; epidermis whitish, ash coloured or brown; cortical part soft and spongy; taste and smell disagreeable.

20. Undulated Ipecacuanha. *Spermacoce hexandra*, Linn. *Richardsonia brasiliensis*, Gomez. *R. scabra*, Martius. (See page 190.)

21. Striated Ipecacuanha of Peru. *Psychotria emetica*, Mutis. Linn. *Ipecacuanha grossa*, Gomez. (See page 189).

22. Annulated or genuine Ipecacuanha. In addition to what we have said of this root, we have only to add that it is known under a variety of names in the different provinces of Brazil, as Poaya do Mato, Cipo de Cameres, Bexuquillo, Cagosanga, Poaya de Botica, &c.

Article XXVII.—*Pharmaceutical Notices.*

[We have received the following short notices from one of our most experienced druggists, and have hailed them with great pleasure, not only on account of their intrinsic interest, but also because we are induced to hope, that the example thus set will be followed by many of the profession, scarcely one of whom but has it in his power to furnish analogous facts of extreme value, in the correction of errors and the advancement of truth. We therefore trust, that we shall be enabled to present our readers with a continuation of these notices, in each succeeding number, and that our brethren will not withhold any interesting facts which they may possess, because they may deem them of but little importance; it is only from practical men thus detailing the result of their

experience that the science of pharmacy is to take that rank to which it is justly entitled.]—Ed.

Although it is not in my power to contribute any thing of much interest or importance to your Journal, I have thought that a few extracts from the note book of my shop would not be without value. There are many facts which pass under our eyes without being noticed, or which, if noticed, are soon forgotten. The practice of keeping a shop diary, for the purpose of recording all the chemical operations of the establishment, should be adopted in every well-regulated establishment. If the quantity of every preparation made, the method pursued in preparing it, and the date of the month and year were regularly noticed, much valuable information would be derived from the record. The apothecary would learn the amount of his sales of every particular medicine, and would thus know what quantities it was most expedient to make or purchase at a time. He would ascertain the age of every preparation in his shop, and could thus judge of the effects of time, light, heat and air upon their qualities. If he were also to note all the circumstances of his experiments, every thing unusual and remarkable in their course, he would be gradually adding to the stock of well ascertained facts, and be performing his duties as a member of the republic of science. A book of the kind of which I speak, in order to be complete, should contain a record of experiments upon every chemical preparation placed upon the shelves. The specific gravity of all liquids, trials of the purity of every preparation, and notes of the external characters of all drugs, if regularly recorded, would form an invaluable body of facts and experience to which to recur. A young man who should commence the practice of his profession on this plan, would learn more by a persevering attention to it than in any other way, and could scarcely fail to rank high as a scientfic druggist.

After all this prelude, I need scarcely inform you that my own note book is very imperfectly kept. I make a few ex-

tracts from it, more by way of opening the door for a class of communications which it is in the power of *all* our druggists to make to you, and which I am persuaded would much enhance the value of your Journal, than for the sake of any thing valuable or striking that I have to offer.

Tincture of Kino.—I have uniformly found this tincture to become gelatinous, and to lose its astringency after a few months. The Kino I have used appears to be the Jamaica Kino, which is said to be an extract of the Coccoloba *uvifera.* It is in small irregular deep brown fragments, translucent, and of a rich ruby red at the edges, softening between the teeth and adhering to them, of an astringent and slightly bitter taste, and colouring the saliva of a reddish brown. This is the Kino with which the American markets is chiefly supplied, and it is sometimes imported from the West Indies in a fluid state. Dr Duncan, in the last edition of the New Edinburgh Dispensatory, is the only author I have met with who notices this fact, and he simply states that the tincture of *some kinds* turns out gelatinous. I have evaporated this gelatinous tincture to dryness, and the Kino thus obtained was tasteless and insoluble both in alcohol and water. The Pharmacopœia of the United States very properly rejects it from the list of preparations. The strength of the tincture of the British colleges is three ounces to two pints, or forty-five grains to a fluid ounce. In putting up prescriptions in which this tincture is ordered, it would be better for the apothecary to make an extemporaneous preparation in the above proportions, using finely powdered Kino, than to trust to the tincture on his shelf.

Calcined Magnesia.—The specific gravity of Calcined Magnesia is stated by Hassenfratz to be .235. We find that a four ounce vial will contain about an ounce of the purest and finest magnesia. By long trituration we may increase its specific gravity so much that a four ounce vial will contain four ounces. This is probably the manner in which Henry's Magnesia is rendered so much more dense than that which is usually prepared. It would appear that there is some peculiar colouring principle in this earth; for most of

the magnesian rocks, talc, serpentine, &c. have a greenish tint. To compare small things with great, I have found magnesia to produce in an assafœtida mixture a marked green colour. Timid customers have returned the vial, suspecting that the colour indicated some poisonous ingredients; but repeated preparations made with the greatest care, acquired the same colour after a few hours. The tincture of assafœtida produces this colour as well as the gum. Fine calcined magnesia, fresh from the kiln, has a delicate hue of the purest rose colour when examined in the mass.

Oil of Gualtheria procumbens.—This is the heaviest essential oil of which we have any knowledge; for I have found it to be 1.17. This furnishes us with an easy mode of testing its purity. The wonderful success of Swaim's Panacea has brought this oil into great vogue with all venders of Catholicons, Panaceas, and Syrups of Sarsaparilla. It appears to be a vegetable principle secreted in plants very widely separated by their natural affinities. The Betula *lenta* or Sweet Birch secretes it in its bark; the Polygala *paucifolia* in its roots; the Spirea *ulmaria*, the Spirea *lobata* and the Gualtheria *hispidula* in their roots and stalks.

Experientia docet.—Trying the purity of some muriatic acid this day, I was surprised to find that a solution of muriate of baryta produced a copious precipitate, indicative of sulphuric acid. I could not account for this, as the acid had been very carefully prepared in a Wolfe's apparatus, and the gas carefully washed. I kept pouring in the saline solution till I was satisfied that the precipitate could not be sulphate of barytes, and then suspected that I had mistaken acetate of zinc for the barytic salt. But experiment soon showed that this supposition was wrong; the precipitate was anhydrous muriate of baryta—chloride of barium; the water of the solution having been abstracted by the concentrated acid. I afterwards saturated this solution with the acid gas, and could not detect the slightest trace of baryta in it, although the bottle contained several ounces. I thus learned to dilute muriatic acid before testing its purity. The

precipitation of muriate of baryta by strong muriatic acid is noticed by Thenard. I had not at the time met with the passage; it was pointed out to me by my friend Dr Franklin Bache, one of the most accurate and learned of chemists.

Let none be ashamed to acknowledge that they have learned by their own errors, and to acknowledge ignorance when accompanied by a desire to improve. If you like my fragments, you will probably hear from me again.

A DRUGGIST.

ARTICLE XXVIII.—*Observations on certain preparations in the Pharmacopœia of the United States. By George B. Wood, M.D., Professor of Materia Medica and Pharmacy, in the Philadelphia College of Pharmacy.*

The following notes are intended to illustrate some of those formulæ in the last edition of the Pharmacopœia, which having been newly introduced, or considerably altered, may not be readily admitted by the medical and pharmaceutic professions without an inquiry into their merits. It is hardly necessary to urge upon the readers of this Journal the great importance of entire uniformity in the preparation of medicines. The only possible method of accomplishing this object is to unite in adopting some one code of pharmacy, with a determination universally to adhere to its provisions, unless in instances where they may be palpably erroneous or impracticable. In this city the Pharmacopœia of the United States, as revised by the late convention, has been recognised by the College of Pharmacy as well as by the College of Physicians, and the authority of no other code can be generally received. Our hopes, therefore, of attaining the highly desirable end of uniformity, rest entirely upon a practical compliance on the part of the two professions with the regu-

lations contained in this work. It is, however, scarcely to be expected that apothecaries will at once abandon for new or altered formulæ, those to which they and their customers have been habituated, simply upon the ground of authority, and without a conviction on their own part of the propriety and utility of the proposed changes. In the remarks which follow in relation to a few of these formulæ, it is hoped that reasons may be advanced sufficient to justify them in the opinion of our pharmaceutists; and nothing more ought to be required to insure their practical adoption in the shops.

Vinum Antimonii.

The points in which this preparation differs from that of the first edition of the Pharmacopœia, are the proportion of the ingredients, and the character of the menstruum. Formerly two scruples of the Tartrate of Antimony and Potassa were dissolved in four fluid ounces of boiling distilled water, to which six fluid ounces of wine were added, so that a fluid ounce of the preparation contained four grains of the salt. At present one scruple of the antimonial is directed to be dissolved in ten fluid ounces of wine, being in the proportion of two grains to the ounce. We shall first consider the propriety of changing the relative quantity of the active ingredient.

The chief object was evidently to render the preparation uniform with that of the British colleges. In the London and Dublin Pharmacopœias, the proportion is two grains of salt to one fluid ounce of menstruum; in that of Edinburgh, it is two grains to the troy ounce. The preparations, though not absolutely identical, approximate sufficiently for practical purposes; and in the United States Pharmacopœia, the proportion has been made to conform precisely with that of the London and Dublin colleges. Among all the nations by whom the English language is spoken, there is a community of literature, which renders it of the utmost importance that the terms employed should have a similar signification. Books written in Great Britain are republished and exten-

sively circulated in the United States; and a difference in the meaning of the same words in the two countries, would lead to inextricable confusion. The medical writings of our transatlantic brethren are not less read and copied by us, within their proper sphere, than those of more general interest; and it is equally necessary, in order to avoid blunders, that the professional terms employed should convey the same idea to the English and American reader. Thus, in the example before us, an English author recommends a certain dose of antimonial wine under certain circumstances, having reference to the preparation as directed by the London Pharmacopœia. His work is republished here, or his recommendation is copied into our own works without alteration; and unless our antimonial wine is essentially the same with that to which he refers, we shall be led into serious errors by following his advice. At any rate, it would be necessary for us in this and all other instances to bear in constant remembrance the difference between the preparations, so as to make the necessary allowances; and it is certainly better that the preparations themselves should conform, than that our attention should be tasked, and our memories loaded with the arbitrary and varying regulations of different colleges. The same reasons which render an identity of meaning in the ordinary terms of our language desirable, wherever it is spoken, apply to medical terms; and if *wine* signifies the same thing in England and America, why should not *antimonial wine*?

These considerations appear abundantly sufficient to justify the reduction in the proportion of the antimonial salt authorized by the convention, unless it can be shown that there is some great and inherent superiority in the preparation as it formerly stood.

We may be told that the druggists were in the habit of uniformly preparing their antimonial wine according to the process of the old Pharmacopœia, and that the people, accustomed to this formula, would complain of a change. But the fact is, that no uniformity in this respect existed in different parts of the United States, or even among the druggists of

the same place. The British Dispensatories, either imported, republished, or somewhat altered and disguised under new names, are widely circulated among us, and their directions have received at least as much attention as our Pharmacopœia of 1820. While many apothecaries and physicians have, in accordance with the latter, prepared their wine with four grains to the ounce, others have followed the former in using two grains; a third set, we are told, have adopted the mean; and we have heard of more than one instance, in which six grains have been employed. Almost any proportion is preferable to this confusion; and it is in favour of the one adopted, that having on its side the weight of the British colleges, it stands the best chance of universal acceptance.

It is not a good reason for declining compliance with the regulations of the Pharmacopœia, that the new preparation would be complained of as inefficient by those who have been in the habit of using the former in domestic practice. Physicians have a right to expect a uniform medicine, and the only guarantee they can have on the part of the apothecary, is an adherence to the recognized standard. Dangerous consequences may result, particularly to children, from the use of a preparation containing more of the antimonial than is calculated by him who prescribes it. I have known death in an infant result from the continued use of small doses of antimonial wine. This is usually kept in families as a domestic medicine, ready for immediate administration in cases of emergency, as in infantile catarrhs and croup, and is very frequently given by the direction of physicians without formal prescription. It is therefore important that there should not be two preparations, one for domestic and another for regular practice, as they would inevitably be in many instances confounded, and frequently to the great detriment of the patient. The question then is, shall regular medical authority or popular opinion be the guide as to the character of the medicine? We might as well ask, shall the artizan judge of the peculiar fitness of his implements, or they who do not pretend to any acquaintance with his business? The

fact is, that very few individuals who purchase antimonial wine for family use would discover the difference. The medicine is generally used in small and divided doses as an expectorant or diaphoretic, or as an emetic for infants; and injury could not possibly be experienced, but, on the contrary, in many instances might be avoided by a diminution of the strength when the preparation is popularly prescribed. It is indeed sometimes called for by adults as a vomit, but in nine cases out of ten the individual would be as well if not better without it, and should he not succeed in producing vomiting with the usual quantity, would ascribe the result to the state of his stomach, as emetics are almost proverbially irregular in their effects. Under ordinary circumstances, Ipecacuanha is much safer than the Tartrate of Antimony and Potassa, and if the apothecary is compelled to sell or prescribe an emetic, the vegetable powder should always be preferred. Besides, even when the antimonial salt is used for this purpose, it is much better given in watery solution, as the vinous vehicle is altogether unnecessary, and might sometimes be an injurious addition.

Another objection which has been started, and in fact must have been in the minds of those who proposed the change, is that by diminishing the proportion of the tartrate, we have more of the stimulant effect of the wine, which is as much as possible to be avoided. But this argument would lead to the use of a saturated vinous solution of the salt; and is not to be weighed against the advantages of uniformity. The proportion of two grains to the ounce has been extensively employed in Europe and this country, and found fully to answer the purposes for which the preparation is intended. Indeed the London college originally directed the quantity of four grains; but in a subsequent edition of the Pharmacopœia reduced the proportion one half. The intention in introducing antimonial wine among the pharmaceutic preparations was to have a solution of tartar emetic which would resist decomposition, and at the same time afford the means of conveniently administering very small doses of that medi-

cine. To meet the latter purpose the proportion of the salt to the menstruum must necessarily be small; and experience has shown that the minute quantity of the vinous fluid contained in a diaphoretic or expectorant dose of the antimonial wine of the Pharmacopœias, can exercise no injurious influence in any case in which a judicious physician would prescribe the medicine. The only use of the wine is to prevent the spontaneous decomposition of the tartar emetic. Is it not probable that the preservative influence of the alcohol is limited to a certain proportion of the salt; and that the larger the quantity of the latter in the wine, the greater would be its liability to decomposition? If such is the case, a preparation containing two grains to the ounce would keep better than one containing four grains; and this argument would alone be sufficient to justify the reduction.

The character of the menstruum is another point in which the preparation of the present Pharmacopœia differs from that of the former edition. Wine is now exclusively employed. The water formerly directed for the solution of the emetic tartar rendered the wine too weak, and the preparation was liable to be injured by time. Nor was the use of water at all necessary, as the pure salt is readily soluble in good wine. The London College, in substituting for the vinous menstruum a mixture of two measures of rectified spirits with eight of water, took care to have a proportion of alcohol quite equal to that contained in the best Teneriffe or Sherry wines. This menstruum has the advantage of containing nothing which could act chemically upon the tartar emetic so as to change its character; but being without colour it might give rise to mistakes, and it is probably more stimulating than wines containing an equal proportion of alcohol. Upon the whole, no fluid answers better in preparing the medicine in question, than good wine, which, while it is sufficiently strong to preserve a due quantity of the salt from spontaneous change, contains no principle which can operate upon it injuriously. Teneriffe or Sherry should be preferred. Inferior wines decompose the antimonial, pro-

ducing insoluble precipitates. Hence, as well as from the impurity of the salt sometimes employed, has arisen the difficulty frequently experienced in making this preparation. Let the apothecary employ crystallized emetic tartar, and good Teneriffe wine, and he will meet with no embarrassment.

Perhaps these observations have been more extended than the importance of the subject might appear to warrant; but the preparation under consideration is one of those which the apothecaries of this city are most reluctant to change in compliance with the Pharmacopœia. It is submitted to their candour and good sense, whether grounds sufficient to justify the alteration have not been presented; and to their public and professional spirit, whether the new formula should not be carried into practical operation.

Emplastrum Plumbi Carbonatis.

This title has been substituted for the unwieldy "Emplastrum Plumbi Subcarbonatis Compositum" of the old Pharmacopœia. There is no occasion for the *compositum*, as there is no other plaster of similar title or composition; and the salt of lead is strictly a *carbonate*, consisting of one proportional of each of its ingredients. The preparation was introduced as a substitute for *Mahy's plaster*, and when properly made answers precisely the same purposes. The directions in the former edition were found upon trial to be altogether inadequate. The oil and carbonate of lead will not unite by the heat of a water bath. By the process as amended in the present Pharmacopœia, a plaster may be prepared, rather too soft perhaps when freshly made, but soon acquiring the proper consistence. Every apothecary should keep this preparation in his shop; and the attention of physicians should be called to its value as a substitute for Mahy's plaster. This is usually spread on both sides of the linen, and is thus very frequently of inconvenient application. It is, besides, not strictly officinal, and should therefore not be countenanced by the profession.

The Plaster of Carbonate of Lead is an excellent application to surfaces inflamed or excoriated by friction, and may be resorted to with great advantage in those troublesome cases of irritated and even ulcerated skin arising from long continued pressure during protracted confinement to one position.

Liquor Morphiæ Sulphatis.

The introduction of Morphia, its Sulphate, and Acetate, were imperiously called for by the deserved popularity of these preparations from opium. The minuteness of the dose of the salts of morphia rendered it very convenient, if not essential, to have an officinal solution, by means of which we might prescribe small quantities without a waste of the material. The sulphate was selected on account of its ready and perfect solubility, and the length of time during which its solution resists decomposition. Water was preferred as the menstruum, because, while it favours but very slightly, if at all, the decomposition of the salt, it never in any way interferes with its medical effect. The proportion of one grain to the ounce was deemed advisable from the facility which it imparts in the regulation of the dose. From one-eighth to one-fourth of a grain being the full dose of the Sulphate of Morphia as an anodyne and soporific, from one to two fluid drachms becomes that of the solution. This preparation is kept in many of the shops in this city, and should be kept in all.

Pilulæ Cathartícæ Compositæ.

The object in the formation of these pills, was to obtain a cathartic compound, which, in a small bulk, would unite the properties of efficiency and mildness with a peculiar direction to the biliary organs. Such a purgative preparation is much wanted in this climate, where congestions of the liver and portal circle are so frequent; and as physicians have found no one among the officinal pills calculated to give general satisfaction, they have been much in the habit of

resorting to a patent remedy, by the name of Lee's Antibilious pills, which is considered by many as superior to any similar compound. It is believed that the Compound Cathartic Pills of the present Pharmacopœia will be found upon trial to answer as good, if not a better purpose; and they have the recommendation of being an officinal preparation, neither secret in the character of their ingredients, nor subject to the monopoly of a single individual or family. An explanation of the principles upon which they were formed will perhaps serve to call attention to them.

As smallness of bulk is of considerable importance, both for convenience of administration and for avoiding offence to the stomach, care was taken, in selecting the ingredients, to reject whatever was inert, and therefore to prefer the extract, in which the virtues of a particular vegetable product were concentrated, to the medicine in its natural state. Hence the Compound Extract of Colocynth and the Extract of Jalap are employed, instead of colocynth and jalap themselves.

To secure great efficiency and comparative mildness is another important object. It has frequently been observed that drastic cathartics, combined together in small quantities, retain all their activity as purgatives, but lose much of their power of irritating the bowels. This observation, though originally the result of experience, might easily be shown, were this the proper place, to be in strict accordance with physiological principles. The selection and apportionment of the ingredients of the pills under consideration, were founded upon this peculiarity of cathartic medicines. All the more active purgatives in common use, with the exception of elaterium and croton oil, which were deemed too powerful, are associated together in proportions corresponding to their respective doses. Calomel, Extract of Jalap, and Gamboge are combined with the Compound Extract of Colocynth, which contains Aloes and Scammony with the active matter of Colocynth. As the preparation consists of four immediate ingredients, the quantity of each of these existing in a dose of the pills will be equal to one quarter of its own

ordinary dose. By this arrangement an excess of any one of the purgatives is guarded against; and violent irritation of the stomach and bowels from that cause prevented.

As one of the objects of the pills is to promote the bilious secretion, and thus relieve that congestion of the portal circle which is so common an accompaniment of our febrile diseases, there was a peculiar propriety in introducing calomel among its constituents; and gamboge probably exercises a similar influence.

The name which has been given to the preparation may at first sight seem objectionable, as it might be applied to any compound pills possessing purgative properties; but when it is considered that the ingredients cannot all be expressed in the title, and no one is sufficiently prominent to give a designation to the whole, and that the preparation is intended as the representative of numerous cathartics, and calculated for a wide range of application, the adoption of the name in question may not, perhaps, be considered an inexcusable deviation from the prevalent system of nomenclature.

Three of the Compound Cathartic Pills containing 10.66 grains of the mass are a dose for an adult. In this quantity are four grains of the Compound Extract of Colocynth, three of the Extract of Jalap, three of Calomel, and two-thirds of a grain of Gamboge. A single pill will generally be found to operate as a mild laxative. In a full dose the preparation acts vigorously on the bowels, producing bilious stools, generally without much pain or disorder of the stomach. It has been much used by several physicians of this city, who have found it to produce all the effects which they had been accustomed to obtain from Lee's Antibilious pills, with as little, if not less inconvenience, and in a somewhat smaller dose.

(To be continued.)

Article XXIX.—*Remarks upon "Oil of Cantharidin," &c. &c. By Jos. Scattergood.*

[Read before the College, Sept. 27, 1831.]

Public attention has recently been called to a preparation of cantharides which is said to contain the vesicating principle in a very concentrated form. As we have not been favoured with the formula for its preparation, and have neither used it nor seen it, we cannot say from actual knowledge whether this is the case or not. It is vended under the name of *oil of cantharidin*, with the proprietor's name affixed, as if it had originated with him. While we cannot avoid awarding to him all the merit which is due for the invention of such a name, we must, in justice to a distinguished chemist, deny him any thing more.

The nomenclature of a science is a compact equally binding upon all who pretend to investigations in it; and every one should consider himself under solemn obligations to maintain it; but more especially those who acknowledge so much devotion to it as to publish the result of their investigations. If departures from this uniformity are permitted, we cannot say how soon the greatest confusion may be introduced.

The article in question purports to be an oil of cantharidin, that is, an oil of the *vesicating principle of cantharides*. Now, every tyro in the science knows that nearly all the proximate principles, whether oleaginous, crystalline, resinous, or gummy, have one name, derived from the common or scientific name of the article from which they are obtained, and generally ending in *ia* or *in:* and, if I am not mistaken, there is not in our whole list one proximate principle which is not itself an oil that contains one as an inherent active ingredient.

Cantharidia or cantharidin is the correct name of the active principle of cantharides, and was *first* obtained in a separate state and its properties examined by M. Robiquet, in 1810, an account of which was published in the Ann. de Chimie, tome

LXXVI. He obtained it by the following process. Boil cantharides in water till every thing soluble in that liquid is taken up; then concentrate the solution by evaporation, and when it is reduced to a thick syrup, boil it repeatedly in alcohol until that liquid ceases to act upon it. Evaporate the alcoholic solution gently to dryness, and put the dry residue in a vial with sulphuric ether, and agitate the mixture for a considerable time. At first the ether will seem to have no effect upon it, but after a few hours it assumes a yellow colour. Decant it off, and allow it to evaporate spontaneously in the open air. It deposits small crystalline plates mixed with a yellow matter. Alcohol takes up the yellow matter but leaves the crystalline plates. These plates when dried between folds of blotting paper are cantharidin in a state of considerable purity. He states, that when thus obtained, it is in small plates having a shining micaceous appearance. Insoluble in water or cold alcohol. Boiling alcohol dissolves it, but lets it fall again in crystals as the solution cools. Ether dissolves it, but not very powerfully; it dissolves very readily in oils; and when applied to the skin it acts as a vesicatory with great energy. The solution of it in oils is equally efficacious.

I obtained cantharidin by the above process three years ago; and again a few days ago, I obtained the etherial solution, but the quantity was so small that the crystalline plates could not be separated. To the energy and efficiency of the mixture of cantharidin and the "yellow substance" M. Robiquet speaks of, (which in this case remained after the ether had spontaneously evaporated) I can bear testimony, as a few drops on linen applied to my arm caused so much pain in less than half an hour that I removed it, and in a short time after a full blister raised. This mixture is readily dissolved in sweet oil, and I have no doubt a solution of this kind would prove a valuable article in cases where quick vesication is required; and by means of it, or the solution of pure cantharidin, paper might be prepared so as to

vesicate with great certainty in one, two, three, four, or five hours, as might be desired.

Sweet oil has long been known as a solvent of the active principle of cantharides. Dr Rousseau informs me, that at least twenty years ago he directed a decoction of cantharides to be made with it, and that it has proved an effectual vesicatory in his practice ever since. A piece of paper saturated with a decoction made by boiling one ounce of powdered cantharides in two ounces of sweet oil* blistered effectually the back of my hand in less than seven hours, and one part of wax and two parts of it melted together forms an elegant light-coloured ointment which produced vesication in about eight hours, and will prove more active, I think, than the ointment of the shops.

Spirit of turpentine has always been considered one of the best solvents of cantharides, and a decoction made with it has long been known as an active article. A small portion of the decoction was evaporated to an oily consistence, and applied to the arm: it vesicated in about three hours. I was much surprised to see in this preparation a large quantity of acicular crystals, the nature and character of which I had not time to investigate: they will form the subject of an interesting inquiry at some future period.†

In experimenting upon other solvents, I find that decoctions in oil of sassafras and cajiput will vesicate in three and a quarter hours, and it is probable nearly all the volatile oils will be found to be equally good.

The haste and circumstances under which these experiments were made, have precluded more than general results; they, however, are sufficient to show that much improvement may be made in our preparations of this valuable drug.

* Dr J. K. Mitchell informs me, that he has used this preparation recently with much satisfaction.

† I find, also, that a tincture of cantharides prepared with ether, and suffered to evaporate spontaneously, leaves a crystalline mass. I had not time to try the virtues of it.

Article XXX.—*On Salicine, the Active Principle of Willow Bark. By P. T. Tyson, and W. R. Fisher, Grad. Col. Pharmacy.*

[Read before the College, Sept. 27, 1831.]

It is now some time since the attention of our pharmaceutic chemists was directed to the existence of an active febrifuge principle, in the bark of the Willow. We believe it was first noticed by M. Leroux, about two years since, and although supposed by him to be alkaline, yet the further examination of Messrs Gay Lussac and Magendie, satisfied both themselves and M. Leroux that it had no claims to rank as such. Contrary to the usual property of alkalies, it was decomposed by acids and rendered incapable of crystallization. The process given by M. Leroux does not indicate in what character it should be considered. The willow bark is first boiled with a solution of carbonate of potassa, the decoction filtered, the extractive precipitated by sub-acetate of lead, and the excess of lead directed to be precipitated by *carbonate of lime.* To insure the absolute removal of all the lead, sulphuretted hydrogen is next employed. The filtered solution is then evaporated to the consistence of an extract, and treated with alcohol, which, being distilled off, furnishes the salicine in crystals, which are to be purified in the usual mode by boiling with animal charcoal.

This process we tried once or twice, without success, and with the additional experience of one or two of our friends, do not hesitate to pronounce it perfectly incompetent to produce Salicine.

Shortly afterwards, a new formula was offered by M. Peschier of Geneva. He dispenses both with the carbonate of potassa and sulphuretted hydrogen. But our experiments, according to his directions, were not more encouraging than in the former case. To both these processes we have objections. The addition of carbonate of lime to precipitate subacetate of lead, appeared at first view rather contrary to

chemical doctrines, and repeated experiments satisfied us that it could not be depended on. Sulphuretted hydrogen invariably detected large quantities of the lead in solution after long boiling with the lime; and we became convinced that the willow bark of our country would not yield salicine by the processes employed in France. Our repeated failures, however, were of some importance in giving us, negatively at least, some idea of the real nature of salicine. We found at the close of each operation that nothing was yielded but a thick viscous liquid resembling molasses both in colour and consistence. We hence inferred that salicine, being neither an acid nor an alkali, must be a principle analogous to sugar, and a subsequent process, founded on this belief, justified the inference.

Knowing that sugar, by the long continued action of heat, was converted into molasses, which resisted all attempts to decolour it, and having found that repeated boilings with animal charcoal had no effect on our treacle of salicine, we gave up all idea of ever procuring this substance by a process which required long boiling with carbonate of lime, and afterwards with animal charcoal. Having adopted the belief that salicine was essentially analogous to sugar in its chemical relations, we proceeded to procure it according to the best methods laid down for extracting that article. The following is the process. A quantity of willow bark reduced to short pieces is to be boiled with caustic lime in water sufficient to cover it. To the filtered decoction, sulphate of zinc is to be added, till it ceases to produce a precipitate. The liquid is again to be filtered and evaporated at a low temperature to the consistence of an extract. This product is to be treated with alcohol so long as it acquires any taste, and finally the alcohol is to be carefully evaporated, when it will yield crystals of salicine. These crystals must be purified by carefully draining off the mother water or rather syrup, and afterwards washing with a saturated solution of salicine. A specimen of the salicine procured by this process is submitted for the cabinet of the college.

With regard to its therapeutic effects, it belongs not to us

to speak. It has already been highly commended by eminent French physicians, and we have submitted some of our own for trial to a medical friend from whom we have as yet received no answer. The properties of this crystalline organic base are already well determined. It has the odour and taste of fresh willow bark, is soluble in both alcohol and water, is insoluble in ether. A more full account of its chemical habitudes and composition may be found in the Journal of this College, pp. 337 and 338, Vol. II., by MM. J. Gay Lussac and J. Pelouze.

SELECTED ARTICLES.

ARTICLE XXXI.—*Peculiar substance discovered in the leaves of the Peach tree (Amygdalus persica). By M. Crousseilles.*

I MADE a decoction of dry peach leaves in distilled water, filtered it and added a solution of acetate of lead. The decoction, which at first was blackish, now became coagulated and assumed a dirty grey colour. I permitted it to remain undisturbed for twelve hours, and afterwards filtered it. Almost all the colouring matter remained on the filter, as did also the vegetable fibre and other heterogeneous principles united to oxide of lead.

The filtered liquor was of a beautiful green colour, and possessed a sweetish styptic taste, which I attributed to the acetate of lead it held in solution. By passing a stream of sulphuretted hydrogen through it, I precipitated all the lead, and coagulated this precipitate by heat; I again filtered the fluid, its taste was now slightly acid and tolerably bitter. Then, to remove all the acetic acid, I submitted the fluid to action of fire with calcined magnesia. I again filtered, evaporated to dryness, and treated the residuum with boiling alcohol.

By a slow evaporation, I obtained a grass green liquid of a sirupy consistence, of a taste at first pungent and afterwards permanently bitter, soluble in water and alcohol; however, it appeared to contain a principle which acted like an

oil. I left it undisturbed for several days, hoping to obtain crystals, but they did not form. I again submitted it to gentle heat; the matter assumed more consistence, gave out an herbaceous odour, and lost its green colour.

I finally obtained a residue which I carefully examined, it presented the following characters:

1. It had a gummy appearance; it was solid, brownish, rough to the touch, crystalline. 2. It had a taste at first pungent, slightly saccharine, mixed with bitter (the very small quantity I took acted by producing slight vomiting). 3. It was soluble in water in every proportion, soluble in alcohol, and insoluble in ether. 4. Its alcoholic solution did not appear to affect vegetable blues. 5. Exposed to the air, it strongly attracted moisture and deliquesced. 6. It underwent no alteration in a vessel hermetically closed. 7. A gentle heat, when it was in deliquescence, restored it to its former state. 8. Finally, inclosed in a tube and exposed to the action of hot coals, it gave out a smell of burning vegetable matter, and was converted into charcoal.

I in vain attempted to obtain crystals, by several times treating it with alcohol. I then acted on it by the hydrochloric, sulphuric and nitric acids, and obtained the following results.

The hydrochloric acid dissolved it; the solution, exposed to the action of heat to expel the excess of the acid, formed, when cooled, a yellowish body with rudiments of crystals. This was very soluble in water, and was precipitated by ammonia. Its aqueous solution had no action on infusion of violets.

Weak sulphuric acid acted on it better when aided by heat. This solution when evaporated gave no crystals; if the evaporation was carried too far, charcoal was formed.

Concentrated nitric acid dissolved it unaltered. The diluted acid also dissolved it. This solution, exposed in a glass capsule to the action of heat till a pellicle was formed, gave prismatic crystals on cooling. A tenth of a grain of these crystals placed on the tongue, produced an acid and acrid

sensation on the fauces. Exposed to the action of burning coals, they fused, swelled, and disappeared, leaving a small residue. The alkalies produced a brown insipid precipitate on being added to an aqueous solution of this substance, which precipitate was reduced to charcoal by the action of fire. I found traces of oxalic acid in these crystals.

From these experiments, I consider the substance obtained not as a vegetable salifiable base, but as an immediate principle, to which the medical properties of peach leaves may be attributed, and not to the hydrocyanic acid, as has hitherto been thought.—*Journal de Chim. Med., January* 1831.

Article XXXII.—*Observations on Prussian Blue. By M. Gay Lussac.*

Some of the following observations are due to M. Robiquet, and I only present my own in confirmation of those made by that able chemist.

Prussian blue, obtained by precipitating the chloride of iron by the ferrocyanate of potassium, was several times washed with cold water; nevertheless the water of the last washings was of a yellow colour, and formed a blue precipitated with the chloride of iron. In a subsequent washing with warm water, this was still more coloured; evaporated to dryness, it left a residue which was re-dissolved in water and produced an abundant blue precipitate with the chloride of iron. After several washings, the Prussian blue was deteriorated in colour, and finally became of a reddish brown. At this time, the washings no longer caused a precipitate with the chloride of iron. The residue was only pure oxide of iron; it was not altered by calcination, and no trace of the alkali was discoverable. On the other hand it constantly afforded potash on calcination as long as it coloured

the water, and it did not cease to do this till it was wholly destroyed. It should be remarked that during this change, hydrocyanic acid was disengaged.

From this experiment it results that the purest Prussian blue contains cyanoferruret of potassium, and that water, aided by heat, entirely decomposes it; it yields oxygen to the iron, and hydrogen to the cyanogen. Chloride of iron was added to a solution of cyanoferruret of potassium in excess, and after multiplied washings with cold water, the fluid was examined; it was of a bluish green colour; but on exposing it to heat, it became yellow and oxide of iron was precipitated; it was capable of decomposing a marked quantity of Prussian blue, in addition to that from which it had been taken, and of reducing it to pure oxide of iron.

Another Prussian blue was prepared by adding cyanoferruret of potassium to chloride of iron in great excess. After very numerous washings, the liquid was of a bluish green colour, like the preceding, and presented exactly the same properties.

These two experiments demonstrate that Prussian blue prepared with an excess of cyanoferruret of potassium or of chloride of iron, always yields the cyanoferruret of potassium to water; this fluid at the same time dissolves some of the Prussian blue; but by the action of heat, the blue is decomposed and regenerates cyanoferruret of potassium; which supposes that the washings are alkaline.

It is proved by these experiments that Prussian blue, prepared with the cyanoferruret of potassium and chloride of iron always contains cyanoferruret of potassium. It must be remarked that the washings must be alkaline, as they decompose the Prussian blue and bring it back to the state of a peroxide of iron.

The quantity of potassium, which we suppose to exist in the state of a cyanuret in Prussian blue, appears to be very variable according to the number of washings it has undergone and the mode of preparation. Thus 100 parts of Prussian blue prepared with the cyanoferruret of potassium

and chloride of iron in excess, gave by calcination 1.442 of potass, or 2.004 of cyanuret of potassium; 100 parts of blue prepared with cyanoferruret of potassium in excess, gave 8.684 of the cyanuret of potassium.

Prussian blue obtained with the chloride of iron and the red cyanoferruret of potassium appears identical with the preceding. It gave potass on calcination, and the bluish green washings became yellow by heat, whilst a precipitate of the oxide of iron took place; the fluid had an alkaline re-action, and was capable of decomposing an additional quantity of Prussian blue.

This alkaline re-action in the washings, which in the first instance may have been acid, is very remarkable. May not the solution of the Prussian blue be owing to this excess of alkali, which however is too feeble to decompose it unaided by heat; for M. Robiquet has remarked that the solution commences the moment the liquid ceases to be acid.

Prussian blue prepared with cyanoferruret of potassium and the sulphate of the oxidule of iron in a very slight excess, acts in a different manner. When it was not of a deep colour, the washings scarcely showed any traces of the cyanoferruret of potassium, they did not deposit oxide of iron on heating them, and they did not decompose the smallest portion of the blue. But after it had acquired great intensity of colour by desiccation in the air on plates, the water with which it was subsequently washed became of a bluish green colour, and manifested an alkaline re-action; on heating it, it became yellow, and deposited oxide of iron and decomposed the blue. It then precipitated the chloride of iron of a blue colour in tolerable quantity. This blue furnished 16 per cent of cyanuret of potassium.

When the cyanoferruret of potassium is treated with sulphuric acid, there is, as is well known, a copious disengagement of hydrocyanic acid, and a precipitation of a white powder which resists a long ebullition in sulphuric acid. After having washed it a great number of times with boiling water, a portion of it was exposed to the air, on a plate.

The substance dried, and only assumed a dirty brown tint. Another portion exposed to the air, after having been moistened by diluted sulphuric acid, rapidly became blue; the acidity disappeared completely, and sulphate of potass was formed. Several other portions were successively neutralized by the same portion, and the precipitate became more and more intense in colour.

The white precipitate was calcined at a red heat, and an oxide of iron mixed with carbonate of potash was obtained. A portion was also burnt with oxide of copper, to which a small quantity of sulphate of copper had been added to saturate the potash, and results were obtained which seem to indicate that the white precipitate is composed of

9 proportions of oxygen,
7 " iron,
2 " potassium.

So, that if we suppose 7 proportions of cyanoferruret of potassium which contain

14 proportions of potassium,
7 " iron,
21 " cyanogen,

there will be (in leaving to the iron 7 proportions cyanogen and to the potassium 2) 21 less 9=12 proportions of cyanogen, which will produce 12 of hydrocyanic acid, that is, the four-sevenths of that contained in the salt, and 12 proportions of sulphate of potass will be formed.

The theoretic result is founded on the supposition, that the white cyanoferruret contains enough cyanogen to become blue, and that the potassium will furnish it with what is wanting.

The white cyanuret is consequently formed of

7 proportions of iron,
2 " potassium,
9 " cyanogen;

and if the potassium, in becoming oxidated, yields to the iron, only 7 proportions of iron and 9 of cyanogen will remain, which is combined as follows to form the blue.

3 proportions of cyanuret of iron,
4 " cyanide of iron.

To verify the theoretic composition of the white cyanoferruret, three grammes were decomposed by calcination, and there was obtained

Peroxide of iron, 1.520 grammes,
Potassium, 0.431 "

There should have been found 1.625 grammes of oxide of iron and 0.465 of potassium; but it should be remarked that the two first numbers are nearly in the same relation as the two last; proving that the salt exposed to calcination was not perfectly dry.

During the action of the sulphuric acid on the cyanoferruret of potassium, it did not dissolve the iron; this metal remaining undiminished in the white cyanoferruret.

The cyanoferruret of copper gave 6.7 per cent of cyanuret of potassium; that of silver 9.3.

The cyanoferruret of lead, after a considerable number of washings, still yielded a small portion of cyanoferruret of potassium to the water, coloured it yellow, and gave it the property of producing a blue with the chloride of iron; potash was also found in this salt, but in less quantity than in that of the silver, and a portion remained combined with the oxide of lead. The presence of potassium in the cyanoferruret of lead prevents the hydrocyanoferric acid from being obtained pure from it, by decomposing it by means of sulphuretted hydrogen, according to the plan of Berzelius. The procedure of Robiquet is in this respect far preferable.

Neither can the hydrocyanoferrate of ammonia be obtained by decomposing the Prussian blue by ammonia; after having exposed it to the action of heat, much cyanuret of potassium was found in the residue.

The cyanoferruret of lead, exposed to the action of heat, presents a phenomenon which merits notice. At first azote was obtained mixed with cyanogen, and hydrocyanate of ammonia. The matter, although red and losing nothing, suddenly became incandescent, and disengaged almost instantly a great quantity of azote. The residue, cooled with-

out being exposed to the air, was black; it was pyrophoric at a few degrees above the ordinary temperature, and gave out ammonia in abundance in a moist air; it also produced much of this, with vapour of water at a red heat. After the spontaneous inflammation of the black matter, there remained a combination of 2 proportions of oxide of lead and 1 of oxide of iron, of an orange brown colour and very fusible under the blow-pipe. The strong incandescence which manifests itself during the calcination of the cyanoferruret of lead is certainly an indication of the formation of a new and very intimate combination. But what is this combination? We shall learn from new experiments.—*Annales de Chimie, January* 1831.

ARTICLE XXXIII.—*Observations on the Sennas, and especially on that called Moka. By M. Fée.*

The pharmaceutical history of the Sennas is still involved in obscurity as regards their origin. It is well known that the Alexandria senna is obtained from the Cassia *acutifolia*, that the Aleppo is procured from the *C. obovata*, and finally, the senna de Palthe is a mixture of the two last, or, in other words, of the leaflets of the *C. acutifolia* and *obovata*, adulterated with those of the *Cynanchum arguel;* as to the Tripoli and Moka sennas, also termed Indian and Senegambian, but little is known of the plant which produces them.

Having had occasion during my annual visits as one of the medical jury to examine a great number of different packages of senna, I have thought I might throw some light on this part of pharmacology.

In attributing, in my pharmaceutic natural history, all the sennas of commerce to the *C. acutifolia, obovata, lanceolata* and *elongata*, I at the same time remarked, that if the

Tripoli senna was derived from the *C. acutifolia* gathered in Sennaar, the locality caused it to differ from that obtained from the same species above Assouan; I also observed, when speaking of the Moka senna, that it did not appear to me that it had been proved to differ from the Indian; it is these doubts, which I entertain in common with many esteemed authors, which I shall endeavour to dissipate.

A comparative examination of the Tripoli senna with that from Alexandria, demonstrates that the leaves of the former are shorter, more fragile, rather more tomentose, with less prominent nervures, and of rather a brighter colour; that its follicles are shorter, thinner, less regular in form, and of a pale yellow; moreover, the nervatures of the leaves and seed vessels are precisely similar to the Alexandrian; hence the slight differences just pointed out are neither sufficient to constitute a species, or even to establish a variety. These two commercial kinds have certainly the same botanical origin; but if we agree with authors on this point, we differ from them in their opinion of both kinds being furnished from the same locality. It is known that the *C. acutifolia* is very abundant in Upper Egypt and Sennaar, that it is brought thence to Boulac, and passes into the hands of the viceroy's (of Egypt) agents, who pay no regard to the difference of locality; they mix some of the different kinds, thus forming senna de Palthe, whilst the remainder is sent to Europe under the name of Alexandria senna. But, if it were true that some of the senna was transmitted from Sennaar to Tripoli, would we not receive from both this place and Egypt similar articles, which is never the case. The leaves of the Alexandria senna are always mixed with some of those of the *C. obovata*, and even of the *C. absus*, as these two species also grow in all parts of Egypt which produce the *C. acutifolia;* and if these are not found in the Tripoli senna, it must arise from their not growing in that part of the country, or else being very rare.

As it is by no means proved that there is any difference between the senna of Bicharia and that of Sennaar, both of

which are furnished by the *C. acutifolia*, how can it be supposed that the Tripoli senna, which is so different from the Alexandria as to be recognisable at the first glance, is derived from the frontiers of Nubia and the right bank of the Nile. What advantage would accrue to the dey of Tripoli to bring it from a considerable distance across deserts, and which, having passed through several hands, is afterwards sent to Europe, and sold at a lower price than that at which it is afforded by the viceroy of Egypt. Commerce is not thus carried on, even in countries where civilization is less advanced than with us.

There is another objection, derived from the appearance of two sennas produced by the same plant in different localities, since the principal form of the leaves and seed-vessels is not sensibly altered; these two sennas are evidently the result of a more vigorous vegetation, which has occasioned an increase in the size of these parts, and given them a firmer consistence and higher colour, &c. Now, may it not be reasonably supposed, that the climate of Upper Egypt is capable of bestowing a vigour on the *C. acutifolia*, which is not to be seen in individuals of the same species growing in Sennaar, a country nearer the line than Bichaïa.

But a single traveller has pretended that the Tripoli senna comes from Senaar, and as travellers are not obliged to furnish proofs of the truth of their assertions, the *ipse dixit* of this individual was believed; in a short time a multitude of persons repeated his assertions, and it assumed a rank among received truths, because in adopting it, each author supported it with the weight of his authority.

We think that we have fully proved by what has been said, that the Tripoli senna is not derived from Sennaar, a country separated from Tripoli by burning deserts, and a distance of near eight hundred leagues. Why, when this impossibility is admitted, not suppose that the *C. acutifolia* grows in Tripoli, since the *C. obovata* is found on the other side of the Red Sea, and even in Syria, on the other side of the Nile, as far as Senegal? If the locality of this species is

so extensive, why limit the *C. acutifolia* to the borders of the Nile? By admitting this hypothesis, the slight differences between the two kinds can be readily explained, which, arising from the vigour of the vegetation, must be in favour of that from Sennaar over that from the Mediterranean territory of Tripoli, and all will agree on this point.

Let us now examine the Moka senna; a variety known under different names and derived from various localities. It generally arrives sorted; sometimes, however, it comes to Europe untouched. This has enabled me to find fragments of branches in tolerable preservation, some of which had the seed vessels attached, and others the leaves.

I will successively describe the leaves of this senna, and the general petioles of the pods; I call the plant which furnishes them *C. elongata* (Lemaire), and will hereafter state why I prefer this specific name to that of *lanceolata.*

1. Leaves of the *C. elongata.* Elongated, narrow, thin and flexible, obscurely mucronate, oblique, petioles short; petiole somewhat thick, median nervure ligneous; secondary nervures almost articulated; upper surface with a few scattered hairs, of a pale yellow, the secondary nervures more prominent than the median; lower surface smooth, median nervure more prominent than the secondary.

Length 12—20 lines. Breadth 3—5 lines.

Odour very strong, similar to that of the other sennas, and a little like that of tobacco; taste herbaceous, nauseous and a little bitter; colours the saliva of a yellowish green.

2. General petioles of the leaves of the *C. elongata.*

Long, thin, arcuated, superiorily smooth, marked by a longitudinal furrow on the upper part, and slight striæ near the furrow, arising from cicatrices indicating the attachment of the partial petioles; they are double, close to each other, each set of leaflets about 8 to 10 lines from each other; there are about five pairs of them.

Length 24—40 lines.

Odour and taste similar to that of the leaves, but in much less degree.

3. Pods of the *C. elongata.*

Thin, smooth, shining, a little arcuated, of an olive green at the edges, blackish at the centre, above which are impressions showing the situations of the seeds: these are from 5 to 7 in number, heart-shaped, rough, and reticulated; nervures anastomosing, thicker near the sutures than at the centre; surface studded with white points (a simple discoloration of the tissue, only visible under a lens), summit rounded, point situate below the curvature, marked tenuity towards the edge which is attached to the peduncle. When this latter resists attempts to detach it from the branch, it becomes bent and as if articulated.

Length 18—24 lines. Breadth 7—9 lines.

Odour rather slighter than that of the leaves. Taste nauseous, very disagreeable, causing a slight sensation of heat in the mouth, no bitterness; they colour the saliva of a yellowish brown.

The proportion in which the leaves, footstalks, and pods occur is as follows:

Leaves,	93	parts,
Footstalks,	6	"
Pods,	1.100	

The question now is, to what species of cassia does this belong?

The Moka senna has been attributed to the *C. lanceolata* of Forskhal; but this species is too closely allied to the *C. acutifolia* for this opinion to be admitted. Authors have separated it to again unite it, and this has been repeated several times. This contrariety of opinion shows that the plant is still imperfectly known. The most marked difference pointed out by M. Delille is the presence of glandular petioles; and the species under consideration has no glands at the base of the petioles, for the dilatation at this place is certainly no gland. We therefore prefer, in the state of doubt in which we find ourselves, retaining the appropriate name of *elongata* given to the Indian senna by M. Lemaire,

and we will complete the description he has given of it. (Journ. Pharm. vii. 345).

Cassia elongata. Lemaire. Fee. Cours d'histoire Naturelle. Pharm. II. p. 69.

Foliis subquinque jugis, elongatis acutiusculis sub mu cronatis, petiolo abbreviato, turgido eglanduloso; fructibus glabris, nitentibus, subarcuatis, apice obtusissimo, mucrone inferiore; 5--7 spermibus seminibus diformibus, rugosis; rugis nitentibus, reticulatis, carcalo recto subelevato.

Habitat in Arabia, necnon in Senegambia an etiam in Indiis.

Should the Moka, the Indian and the Senegambia sennas be regarded as distinct? Certainly not, for the most practised eye cannot discover any difference between them. It is not even proved that the *C. elongata,* which furnishes the whole of them, grows in all the localities from whence it is sent to Europe. According to the inquiries I have made, the senna which comes from Moka or Senegambia direct, is generally sorted, and is larger in its proportions, whilst that from India is not sorted, and has rather narrower leaves; but except these slight differences, it must be allowed that the state in which the leaves and pods are found in our shops, wherever they may have been brought from, is exactly the same.

But to conclude. The sennas which we receive from Alexandria and Aleppo are derived from cassias which grow in Egypt, Sennaar or Syria; that which comes from Tripoli grows in that regency.

The slight physical differences discoverable on a comparison of the leaves and pods of the Alexandria senna with those of the Tripoli, is explainable by the difference of locality.

The Moka, India, and Senegambia sennas are identical in their physical properties. They are produced by the same species of cassia, which appears not to be the *C. lanceolata* of Forskahl, but the *C. elongata* of Lemaire.

It is by no means proved that the Moka senna, to which

the name of long leaved senna is correctly applied, grows in all the localities from whence we procure it. We will conclude by observing, that if it were true, as several practitioners have asserted, that the long leaved senna purges as well as the senna de Palthe, or the Alexandria and their follicles, it ought to be preferred to all others, as it is less easily adulterated, and it may be readily freed from admixture of other plants, which cannot be completely effected with senna de Palthe, and hence there would be no danger from the cynanchum, or from the redoul, which is still more dangerous in its effects.—*Journ. de Chim. Med., April* 1830.

ARTICLE XXXIV.—*Observations on the Extraction of Morphine by means of Alcohol and Ammonia. By M. Regimbeau, Sen., Pharmaceutist, Montpellier.*

A great variety of methods of procuring morphine have been successively published, but the mode which has succeeded the best with me is that indicated by M. Guillermond of Lyons in the *Journal de Pharmacie,* August 1828. Advantageous as regards the facility with which it affords a large quantity of the salt, it is still susceptible of modifications which will enable us to obtain this vegetable base uncoloured, and almost wholly freed from narcotine. M. Guillermond's plan is as follows:

"Take two pounds of opium, pound it as fine as possible, infuse it in eight pounds of cold alcohol at 30°, frequently agitating the vessel containing it; after digesting for three days, strain through a cloth; treat the marc with two pounds of the same menstruum; strain this second infusion and add it to the first. To this filtered solution add two ounces of ammonia and stir it well; the liquid assumes a slightly turbid

appearance; let it remain at rest for two or three days, after which it is to be filtered; the sides of the vessel will be found studded with crystals, which are to be detached and thrown on the filter. If they be dried they will be found to weigh four ounces, four drachms; they are of a brown colour; they are to be washed with water, which dissolves the colouring matter as well as the meconate of ammonia, and leaves the crystals of morphine of a light reddish colour; when they are carefully dried they weigh two ounces, four drachms."

M. Guillermond considers the crystals as almost pure morphine, and as not containing more narcotine than when obtained by other processes. Desiring to ascertain how far this assertion was correct, as M. Guillermond does not say what becomes of the narcotine in his operation, I repeated the process of this pharmaceutist on four ounces of opium.

Experiment 1. A solution of ʒiv of opium was made in ʒxx of alcohol at 30°.* This solution was filtered and treated by ʒiv of ammonia at 22°, double the dose indicated by M. Guillermond.† The fluid assumed a turbid brown tint, and rapidly formed very brilliant crystals. After standing undisturbed for three days it was filtered, the crystals were detached and thrown on the filter; when dried they weighed ʒiv.‡ They were of a reddish colour; after being reduced to powder, washed in cold water, and carefully dried, they only lost a few grains in weight. The fluid with which they had been washed was slightly coloured.

* This solution was prepared by the above mentioned plan, as were all the solutions hereafter spoken of.

† This quantity of ammonia appeared to me to be necessary to precipitate all the morphia of the opium on which I operated. After having employed half this quantity, the fluid scarcely darkened turmeric paper; it was somewhat turbid, and did not immediately precipitate crystals. M. Hottot indicates, in his process with water, these same proportions of alkali to treat certain qualities of opium, rich in active principles, but generally he employs the doses recommended by M. Guillermond (two drachms of alkali to four ounces of opium). This latter does not state the strength of the ammonia he employs.

‡ M. Guillermond obtained from the same quantity of opium a precipitate weighing four drachms and a half, which was reduced to two drachms and a half by washing with cold water.

The product of this process, according to M. Guillermond, is almost pure morphine; however, every thing led me to believe that it contained, without speaking of the sub-meconate of ammonia, which is not very soluble in cold water, a marked quantity of narcotine. To obtain pure morphine from it, I successively treated it with several doses of boiling alcohol at 36°, in order to perfectly dissolve it, and I obtained from each solution on cooling, morphine nearly freed from narcotine. The alcohol of the second and third treatment was almost colourless, and deposited the morphine of a very white colour, rendering it unnecessary to bleach it by means of charcoal.

The alcoholic solutions from which the morphine had been separated, necessarily contained the narcotine and the sub-meconate of ammonia; for both those substances are more soluble in alcohol than the morphine. To precipitate the narcotine from the solution, I diluted this with distilled water till it marked 14° B., knowing that the sub-meconate of ammonia would still remain in solution. The narcotine was precipitated in a slightly brilliant powder. After permitting it to deposit, it was thrown on a filter to separate it from the alcohol. When dried, it weighed gr. lvij. This experiment confirms the assertion of M. Thenard on the greater solubility of narcotine in alcohol than of morphine, a fact denied by some esteemed authors.

The greyish powder thus obtained still contained some morphine, as was proved by the red colour it assumed when tested by nitric acid, though the quantity was very small, and it was easy to show that the substance was almost wholly composed of narcotine; for if it be placed on blotting paper and exposed to a moderate heat, it liquefies and is imbibed by the paper, like melted rosin. It is also very soluble in the essential oils, both of which characters it is well known distinguish narcotine. It may be remarked, however, that this same narcotine was not entirely soluble in ether, which indicated that it was not perfectly pure. It may contain, besides the morphine, some colouring matter.

Thus ℥iv of opium treated by the process of M. Guillermond, furnished me with ℥iv of what that operator considered as almost pure morphine, and which nevertheless, as has been shown, lost half its weight by the alcoholic treatment I subjected it to, and gave, as a definitive result, but ℥ij of morphine, which was previously combined with gr. lvij of narcotine and the sub-meconate of ammonia which remained in solution in the diluted alcohol.*

Experiment 2. In a second operation, a solution of ℥ij of opium in only ℥viij of alcohol instead of the ℥x employed by M. Guillermond, was treated by ℥ij of ammonia; this gave a precipitate weighing 128 grains; this precipitate, when washed with cold water, lost one fourth of its weight, so that it was reduced to 96 grains. This product, treated with boiling alcohol, furnished on cooling 64 grains of crystallized morphine. This morphine was not very white, and not entirely soluble in acetic acid, like that of the first experiment. The alcohol from which it was precipitated was diluted with water, and deposited the narcotine, which when dried weighed 24 grains.

The results of this last operation differ from those of the preceding in several particulars. 1. The precipitate was proportionally less abundant than that of operation No. 1. 2. This precipitate, when washed in cold water, lost one fourth of its weight. 3. Finally, the washed precipitate, having been treated with boiling alcohol, also gave proportionally less pure morphine and less narcotine.

Struck with the difference of the results of the two operations I have detailed, results which also differ from those obtained by M. Guillermond, and desirous of ascertaining how far the doses of alcohol and ammonia were capable of influencing the phenomena, I made the following experiments.

* From some experiments, I am satisfied, that the alcoholic tincture to which the ammonia has been added, from which the precipitate furnishing the morphine has been obtained, does not contain any sensible portion of this latter substance, or of narcotine. The same may be said of that part of the opium which is insoluble in the alcohol.

1. A solution of ʒij of opium in ʒi ʒij of alcohol, was treated with gr. ix of ammonia, and gave a precipitate weighing gr. xv. This precipitate washed in cold water lost gr. iij, the remaining gr. xij being the almost pure morphine of M. Guillermond; but this morphine, as we have already shown, is still united with narcotine, and perhaps also with a little sub-meconate of ammonia, which could not be removed by the cold water. To separate the morphine, entirely, I dissolved the above mentioned product in boiling alcohol; this solution on cooling deposited gr. viij of well crystallized morphine, though somewhat coloured.

2. The same quantity of opium (ʒij) dissolved in the same manner, in the same quantity of alcohol (ʒi ʒij), was heated with gr. xviij of ammonia instead of ix: the precipitate weighed gr. xvij. Washing in cold water caused a loss of gr. iij. This last product of gr. xiv was subjected to the action of boiling alcohol; which furnished on cooling gr. xij of dry, well crystallized morphine, but rather more coloured than No. 1.

It results from a comparison of the two operations I have just detailed, that a determinate quantity of an alcoholic solution of opium, treated by the dose of ammonia indicated by M. Guillermond, gives a smaller precipitate than an equal quantity of the same solution treated by a double dose of ammonia; the two precipitates when washed in cold water, lose the same weight; but, as the procedure of M. Guillermond terminates with this washing in cold water, it is evident, that the use of this plan will give an impure product, whether the alcoholic solutions of opium be treated by the indicated dose of ammonia or by double the quantity.

If the two precipitates are subjected to the action of boiling alcohol, that produced from the solution treated by the double dose of ammonia, gives 33 per cent more of crystallized morphine than that in which a less dose of the volatile alkali has been used. Instead of acting on the ʒij of opium with ʒi ʒij of alcohol, as in the preceding experi-

ments, I made two other solutions in employing but ℥i of alcohol to the ℥ii of opium.

3. One of these solutions treated with gr. ix of ammonia, furnished, as in No 1, a precipitate of gr. xv, which after being washed in cold water was reduced to gr. xij. These gr. xij, after the action of boiling alcohol, gave gr. ij of very white crystallized morphine.

4. A precisely similar solution of opium, treated by gr. xviij of ammonia, gave a precipitate of gr. xvi, which after being washed in cold water was reduced to gr. xii; the washed precipitate treated with boiling alcohol furnished gr. viij of crystallized morphine, less white than No. 3, but less coloured than No. 1 and 2.

In the two last experiments, as in those which precede them, the precipitates obtained by the different doses of ammonia were of the same weight within one or two grains; they also experienced about the same reduction by washing with cold water, and the product in morphine of that which resulted from the action of one dose of ammonia was 25 per cent more than the other; but if the product in morphine of No. 3, in which a solution of ℥ij of opium in ℥i of alcohol was treated with gr. ix of ammonia, be compared with that of No. 1, obtained by the action of the same quantity of ammonia on a solution of opium made with a larger quantity of alcohol, it will be seen that this latter product is more considerable than the former. The same may be said of the 2d, which is larger than the 4th.

From those experiments it follows, that an augmentation in the product of pure morphine is obtained, either by augmenting the quantity of alcohol employed to dissolve the opium, or in enlarging the dose of ammonia used to precipitate the morphine, so that when a small quantity of alcohol is used as a menstruum and a larger dose of ammonia, the same results take place. Ex. 1 and 4.*

The morphine I obtained from each of the four experi-

* This requires confirmation, for a great excess of ammonia redissolves the morphine.—*Note of French Editor.*

ments just detailed, was more or less coloured; this colour is evidently owing to a foreign principle, which may be furnished by the water of crystallization; for I have remarked that the morphine was higher coloured in proportion to the regularity and perfection of its crystallization, and the abundance of the alcoholic fluid in which it was crystallized.

When this fluid was employed in a less quantity, the crystallization was confused, and the morphine was much whiter. The same results took place when the evaporation was pushed too far.

Can the water of crystallization (if any exists in the morphine), as well as the colouring principle, foreign to this substance, be the only causes of the difference to be observed in the weight of the products of the different experiments? To be assured on this point, it is necessary to make fresh examinations, by acting on large quantities of opium, two drachms being too small to give precise results.—*Journal de Pharmacie, April* 1831.

Article XXXV.—*Notes on Salicine, Jalapine, and Cetrarine. By M. E. Herberger of Munich.*

I undertook with Professor Buchner a series of experiments on the nature of salicine, as it was described in a state of purity by M. Leroux. We assured ourselves that this substance, generally considered as simple, is compound, and we have even been able to separate from it an alkaloid constituent principle and a sub-acid.

The basal principle of the salicine of M. Leroux possesses the properties of a true alkaloid, except that it dissolves with facility both in alcohol and distilled water. We burnt a portion without being able to detect any appreciable residue. This principle is principally distinguished from the

common salicine by its alkaline reaction on litmus paper, by its crystalline form, which, however, is prismatic; by its solubility in water being greater than that of common salicine, whilst absolute alcohol acts more energetically on the latter; and, finally, by its reaction both on the concentrated and diluted acids.

The salts we have prepared with it are, the sulphate, the nitrate, the phosphate, the acetate, the tartrate, the oxalate, and the hydrochlorate. All these salts are more or less soluble in absolute alcohol; but sulphuric ether does not dissolve the slightest fraction; during the evaporation of the alcohol, they separate (from the absence of water of crystallization), in a pulverulent, flocculent, and sometimes mammillated form. Treated before a blow-pipe, they first melt in their water of crystallization, then become dry, and afterwards again melt at a high temperature, giving out a peculiar odour, like that of burning quinine, and leave a light charcoal which may be entirely dissipated by an augmented heat.

Moreover, the capacity of saturation of the true salicine is very small, and but little superior to that of the sub-alkaloids.

All the salts above spoken of, except the acetate, crystallize in prisms, sometimes presenting superb forms. The acetate was obtained in a granular state. Several of these combinations rapidly effloresce: their taste is generally bitter without acidity. The salicine whose characters I have just given, was obtained by the following process: common salicine was dissolved in a solution of oxalic acid, and this acid afterwards separated by lime, &c.

But we were not content with obtaining the base of this salt; we also separated the sub-acid portion, by treating it with phosphoric acid at a moderate temperature. This acid substance, which is the cause of the aromatic smell of the common salt, and from which the true salicine is perfectly free, may be obtained by distillation. It possesses all the properties of a sub-acid. However, the true salicine does

not possess any therapeutic powers superior to those of the compound salt, and is merely interesting in a scientific point of view

The *resin of jalap* also occupied our attention; and we have been fortunate enough to separate from it a constituent sub-alkaloid principle, and a sub-acid, by means of acetate of lead. The solution of the resin in alcohol was treated with an alcoholic solution of acetate of lead; it formed a slight precipitate composed of oxide of lead and the resinous sub-acid under consideration, whilst the acetic acid combined with the resinous sub-alkaloid, forming a sub-acetate, a combination from which it was easy to separate the jalapine in a pure state.

This is colourless, as transparent as glass, scarcely soluble in boiling water, but readily so in alcohol. It is also dissolved by concentrated acetic acid, especially when aided by heat, and in a less degree by sulphuric, hydrochloric, or phosphoric acids, forming with them combinations, which, though not entirely neutral, are colourless, inodorous, and possessing more or less taste. We have not yet been able to procure it in a crystalline state.

Cetrarine is a bitter, sub-alkaline principle found in the *Cetraria islandica.* In treating this lichen with boiling water, till no more bassorine or gummy matter is separated, it at last becomes freed from the bitter principle. The decoctions are then evaporated after having been filtered, the residue is treated with cold water and again filtered, and the fluid reduced to the consistence of an extract which is to be subjected to the action of boiling alcohol. This tincture is then to be concentrated; the residue to be washed with cold ether, and finally with acetic acid to remove a slight admixture with a salt of lime. It now only remains to again wash with cold water, which, however, must be done cautiously, to obtain the *cetratrine* almost colourless, having only a slight gray tint; it has a peculiar, but extremely bitter and penetrating taste. Its smell is scarcely perceptible. Subjected to the action of boiling water, it first softens, as-

suming the consistence of wax; afterwards, in becoming liquid, it turns brown and swells, exhaling empyreumatic acid vapours, and finally leaves a carbonaceous residue which may be volatilized by aid of an elevated temperature, with the exception of a small residue.

The cetrarine which has already been prepared by the illustrious Berzelius in a more simple manner, but which he did not procure entirely pure, is almost insoluble in cold water, though, from the intensity of its bitter, it communicates this taste to the fluid. Boiling water takes up more of it; but it should not be exposed to the action of heat for any length of time, as it is liable to be decomposed, and to form a brown, inodorous, insipid substance, whose characters have much resemblance to those of ulmine. Boiling alcohol acts in an analogous manner; when cold it does not dissolve more of it than boiling water.

I procured several combinations of cetrarine with different acids. They are uncrystallizable, more or less soluble in water, and possess somewhat of the bitter taste of the base, but in a very diminished degree. The acetates of lead, when added to solutions of cetrarine, produce gray flocculi; the salts of the oxide of mercury cause white, mucilaginous precipitates; the chloride of tin, as well as the salts of iron induce no change. Concentrated sulphuric acid renders the cetrarine brown and carbonises it; by nitric acid it is transformed into a resinous yellow mass. I was not able to ascertain, from the small quantity on which I operated, whether oxalic acid was at the same time formed. Finally, cetrarine has such feeble powers, that it forms one of the last of the series of this kind of bodies, and should be arranged near the amphoteric organic principles.

Cetrarine is poisonous, and should only be prescribed in very small doses; less than six grains of this substance caused me considerable headach. The chemical nature of cetrarine fully explains the difference in the efficacy and taste of preparations of Iceland moss as prepared by different druggists.—*Journal de Pharmacie, April* 1831.

Article XXXVI.—*Physiological and Chemical Observations on the Berries of the Juniper. By A. C. Nicolet.*

The Juniper belongs to the dicotyledinous plants of the natural family of the *Coniferæ*, J. and *Diœcia monodelphia*, L.; it has female flowers, composed of three concave, closely united scales, at the base of each of which is an ovary; after fecundation, these scales unite, enlarge and form a globular and somewhat fleshy berry, containing one or more hard seeds.

M. Recluz has shown that the triangular seeds of the *I. communis* are furrowed, and that these depressions contain fusiform *utriculi* filled with a volatile oil. This structure is not peculiar to the *I. communis*, I have also remarked it in the *I. virginiana*, *I. sabina* and *I. chinensis*.

The berries of the *I. communis* are globular, and contain three seeds, sometimes more; these seeds are triangular, marked with furrows, in which are utriculi filled with volatile oil. These bladders are ovoid at the base of the seeds, and fusiform in the lateral depressions.

The berries of the *I. virginiana* are small, of a deep blue colour, ovoid when they contain but a single seed, bilobate and sometimes triangular when they contain two; in the latter case, one is very small and flattened. The seed is ovoid, marked with grooves containing small utriculi, which are round at the base and fusiform at the sides.

The berries of the *I. chinensis* are round, bilobate or triangular, having an ovoid seed where they are round, and two triangular ones where they are of the latter form; these seeds are also furrowed and furnished with elongated utriculi.

The berries of the *I. sabina* are ovoid, of a deep blue colour, and contain a small oval seed, with grooves and very elongated utriculi.

Chemical examination of the berries of the I. communis. The berries of the *I. communis* are alone used; a volatile oil is obtained from them; in some mountainous countries, more especially in the north, a fermented liquor is made from them

which is termed gin. In other countries, as Germany, and particularly in Switzerland, Juniper berries are employed to aromatise certain articles of food, which are preserved by aid of the fermenting process; in the latter country a tincture is also made which is used in making a *liqueur*.

Wishing to separate the saccharine and resinous matters, I infused bruised Juniper berries in a sufficient quantity of water; after a long maceration they were expressed, the fluid filtered and evaporated to the consistence of an extract; this extract was dissolved, treated with sub-acetate of lead, the precipitate separated by filtration, and the metal thrown down by sulphuretted hydrogen; the clear liquor when evaporated furnished a syrup analogous to molasses, which was endowed with the properties of saccharine matter.

The berries, when distilled with water, furnished a small quantity of volatile oil; after the operation they were separated from the remaining fluid and expressed.

I have remarked that the utriculi which were not broken during the bruising of the berries, remained unaltered after the distillation.

The liquid was very turbid; it was of a greenish colour, but the matter which thickened it was separated by filtering. This matter was soluble in boiling alcohol; by cooling it, a substance was precipitated analogous to vegetable wax, and the filtrated alcohol, when evaporated, left turpentine as a residuum. Thus the resin is only removed, and should not be found in the extract of Juniper made by decoction.

The residuum from the evaporated water was an extract of a disagreeable taste.

The berries of the Juniper, thus exhausted by water and dried, were several times treated by boiling alcohol; the filtrated alcohol was strongly coloured with green; when cooled, it deposited abundant flakes of a matter resembling wax; this matter was separated from the liquid by filtering.

The alcohol, after having been distilled, furnished a green turpentine, which being mixed with a small quantity of alcohol, precipitated, at the end of a few days, a substance of a crystalline appearance. Sometimes the deposit is not

made, but then the liquid becomes covered with a crystalline pellicle. This matter, expressed through paper to separate the turpentine from it, then dissolved in alcohol and filtered through animal charcoal, crystallized during the spontaneous evaporation of the liquid. At the first operation it is highly coloured with green, but by repeating it a great number of times it may finally be obtained in brilliant flakes of pearly appearance, which group around several points, forming rosettes whose flakes appear to assume a rhomboidal form.

When the alcohol which contains the dissolved crystalline matter is evaporated by a gentle heat, a mass is obtained, which, when cooled, presents crystalline rays diverging from different points.

This matter resembles in some degree the resins; it is fusible, is soluble in ether, alcohol or the volatile oils; it is insoluble in water, and chlorine changes it. In its greatest purity the flakes are very brittle and easily pulverized.

The matter, which is precipitated during the cooling of the alcohol, is analogous to vegetable wax; it is greenish, and may be bleached by chlorine; it is soluble in ether, as also in alcohol and the volatile oils when heated, but it separates itself from them when cold; in this state it is pulverulent. That which is precipitated from the essences, when seen through a microscope, presents a species of crystallization. This matter is easily melted, and diffuses an aromatic odour.

I am indebted to M. Henry, Jun. for the following analysis.

A crystalline resinous matter, volatile under the form of a white smoke, with an aromatic odour, pungent and somewhat analogous to the volatile oil of bitter almonds.

One hundred parts furnished:

Carbon	75.04
Hydrogen	5.1037
Oxygen	19.8563
Azote	?
	100

Matter analogous to vegetable wax, white, in small, micaceous flakes, easily melted, and imparting an aromatic odour resembling that of wax.

One hundred parts of this matter afforded:

Carbon	65.400
Hydrogen	7.3227
Oxygen	27.2773
	100

Thus the berries of the Juniper, besides the essential oil and the saccharine matter, contain a vegetable wax, which has a tendency to crystallize in pure volatile oils, and also a resin, which is remarkable for the facility with which it crystallizes when it is freed from the turpentine, from which it is extracted.

I intend continuing this analysis in order to complete the history of Juniper berries.—*Journal de Pharmacie, June* 1831.

ARTICLE XXXVII.—*Memoir on the preparation and medical uses of the Proto-tartrate of Mercury and Potash. By MM. F. Carbonell, M.D. and Bravo, Pharmaceutist.*

The super-tartrate of potash dissolves, by aid of heat, the protoxide of mercury, and gives rise to two very different salts, viz. the tartrate of mercury, and the proto-tartrate of mercury and potash. The first, composed of tartaric acid and the protoxide of mercury, is almost wholly insoluble in cold water, and almost so in hot. The second is very soluble in all proportions of this fluid, both hot and cold; in fact, it dissolves in an equal weight of water at 20° R.; it is even deliquescent; cannot be obtained in crystals; is in the form of a dry mass, looking like ice.

During the action of the super-tartrate of potash on the protoxide of mercury in water, the tartaric acid combines in two ways with this oxide; the excess of the acid forms a simple salt, or the *tartrate of mercury*, which is almost wholly precipitated on cooling, whilst, in evaporating the liquid, the double salt or the *proto-tartrate of mercury and potash* is obtained.

The state of oxidation of the mercury has no influence on the results, the tartaric acid only combining with the protoxide of the metal. If this is in the state of a protoxide, a direct combination takes place; if, on the contrary, it is in the state of a deutoxide, a portion of its oxygen acts on the carbon of the tartaric acid which is decomposed; and a great quantity of carbonic acid gas is disengaged, which can be collected under proper receivers.

The proto-tartrate of mercury may also be prepared by double decomposition, that is, by pouring a solution of the neutral tartrate of potash into a solution of the nitrate or sulphate of mercury, as has been recommended by several chemists; but the double salt can only be obtained by the direct action of the super-tartrate of potash on the protoxide or deutoxide of mercury in water, and by the aid of heat.

After this action the liquid is to be filtered by means of unsized paper placed on clean linen, that it may pass rapidly; it deposits at the bottom of the vessel a crystallized saline crust, principally composed of the super-tartrate of potash, and a certain quantity of the proto-tartrate of mercury; the liquid is now to be decanted and evaporated, when the tartrate of mercury and potash precipitates. During the evaporation the filtered liquor successively precipitates the proto-tartrate in the form of a white crystalline powder, which must be separated as fast as it is formed.

The proto-tartrate of mercury and potash is somewhat of an ash colour; its taste is cool, pungent, and metallic; it is slightly alkaline, as it restores the colour of litmus paper changed by an acid. The acetic, nitric and hydrochloric acids decompose it, and the cream of tartar is precipitated;

it is not decomposed in the humid way, even when it is treated with a solution of potash, soda, ammonia, the hydro-sulphates of these salts, or by the hydro-sulphuric acid. To analyse it, recourse must therefore be had to the dry way*.

An attentive perusal of the different formulas given for the preparation of the tartrate of mercury, will show that this salt has almost always been made by mixing a solution of the tartrate of potash with one of the nitrate, sulphate, or deuto-chloride of mercury. But all these formulas give only an almost insoluble simple tartrate of mercury, and never the double salt under consideration. It is true, that in a few pharmacopœias it is recommended to use the cream of tartar and the oxide of mercury; but directions are only given to collect the quantity of proto-tartrate of mercury, which first crystallizes and precipitates on account of its little solubility; this is then to be washed in pure water, but no caution is given to preserve the water which has taken up the soluble portion or the proto-tartrate of mercury and potash.

We will indicate the precautions to be observed to obtain this double salt.

1. An exact mixture is to be made by long trituration of one part of the protoxide or precipitated deutoxide of mercury, from the nitrate of the same, and two parts of finely pulverized cream of tartar; this mixture then to be gradually thrown into an earthen pot capable of holding from twelve to sixteen pounds of boiling water to each pound of the mixture. The liquid must be filtered whilst boiling through blotting paper placed on thin muslin.

2. The filtered liquid is to be evaporated to dryness, taking care to separate all the mercurial tartrate which is

* The atomic composition of the proto-tartrate of potash and mercury, according to the doctrine of Thomson, is

Tartaric acid, 2 atoms	16.5
Protoxide of mercury, 1 atom	26.0
Protoxide of potassium, 1 atom	6.0
	48.5

precipitated in the form of crystals or pellicles; this may be done with a wooden or ivory spoon as fast as they form, and the liquid is to be filtered as often as necessary, viz, as often as it deposits this simple tartrate.

3. The evaporation to dryness of the proto-tartrate of mercury and potass should be effected in glass, or glazed earthen vessels, by a sand bath or small fire, or, what is still better, in a water bath; the heat must be more especially managed towards the close of the operation not to decompose this double salt; when the matter is reduced to an appearance of ice, it is to be further dried by the heat of the same evaporating vessel removed from the fire.

4. Finally, this salt must be kept in glass vessels with ground stoppers, and coated with some opaque substance to prevent the action of air and light upon it, as this, like all the mercurial compounds, is injured by these agents. Metallic vessels are not to be employed either in the preparation or preservation of this salt.

The proto-tartrate of mercury and potash is prescribed in solution, or in pills made with some mucilage, syrup, or extract, as that of bark, and to this may be added other articles, as the extracts of hyocyamus, or aconite, when it is employed in cases of venereal pains complicated with rheumatism.

I am convinced from long experience, that this salt is endowed with energetic properties, and that it may be employed with the greatest success in inveterate venereal disorders. The dose in which I administer it is from two to twelve grains in adults; there need be no fear in augmenting these doses, as it is not caustic, if it has been well prepared and deprived of the tartrate of mercury; it never occasions salivation; at the same time, I will add, that in a majority of cases I have found a dose of six to eight grains, twice a day, quite sufficient.—*Journal de Chimie Med. March*, 1831.

REVIEW.

ARTICLE XXXVIII.—*A Manual of Materia Medica and Pharmacy, comprising a concise description of the articles used in Medicine, &c. &c. From the French of H. M. Edwards, M.D. and P. Vavasseur, M.D. Corrected and adapted to British practice. By John Davies, M.R. C.S. Surgeon in the Hert's militia, late Editor of the London Medical and Surgical Journal, &c. London, Whittaker, Treacher & Co.* 1831, *pp.* 490, 8vo.

Most of our readers will doubtless be somewhat surprised on reading this title page, as they may have some recollection of the appearance of a work with a similar title about a year and a half since, except, that instead of by John Davies, &c. is to be found "translated from the French, with numerous additions and corrections, and adapted to the practice of medicine and the art of pharmacy in the United States, by Joseph Togno, M.D. &c. and E. Durand, member of the Philadelphia College of Pharmacy." But their astonishment will be increased when they are told that this Dr John Davies, &c. &c., has absolutely published this American translation as his own, not, we will do him the justice to say, absolutely asserting that it was *bona fide* his translation, but leaving this to be inferred, by never alluding to the real authors of it, or even hinting that it had ever before appeared in an English garb, except in a short note at page 27. This is not the first time that some of our transatlantic brethren, although they decry American science and literature, and

appear to consider all that emanates from our presses as beneath their notice, have shown themselves not a little eager to profit by our labours, whenever it could be done without much danger of detection. Had the American edition of the Manual of Materia Medica and Pharmacy been a mere translation of the French work, and thus republished without acknowledgment by Dr Davies, however uncourteous we might have considered such conduct, we should still have passed it over without comment; but when the English editor has adopted by far the greatest proportion of the valuable additions made by MM. Togno and Durand, without the slightest allusion to the source from whence he derived them, incorporating them with the original matter of the work, it would be doing injustice to ourselves and our friends to permit such an open attempt to appropriate the fruits of their industry and learning, without noticing it in the manner it so richly deserves.

That we may not appear to have descended into an unwarranted harshness of language in our animadversions on Dr Davies's conduct, we will endeavour as briefly as possible to show the grounds for our assertions. In the preface he says, "The editor submits an English edition of MM. Edwards and Vavasseur's Manual to the opinion of his medical brethren in this country, with the hope that it may be found to facilitate the study of those branches of the healing art of which it treats. He has been induced to undertake the task of preparing the present edition, after giving a full consideration to the merits of the works on materia medica and pharmacy published in Britain. Whether his labours are likely to lead to any benefit to the profession he leaves to his brethren and to time to determine." "The editor has made numerous corrections in the present edition, and he has added some new matter to the work." Thus it will be seen that not one word is said of his making use of the American translation, nor can it even be inferred that another edition of it had ever appeared in English, except from the words "the editor has made numerous corrections in the present

edition," and these are as applicable to the French as to the American edition.

Let us examine what these numerous corrections amount to. From a careful comparison of the two works, we find that the English is almost a verbatim copy of the American, except in a few instances, where the English editor has corrected some errors in construction and idiom, which had unavoidably crept into the phraseology of the American translators, both of whom being foreigners, could scarcely be expected to understand those niceties of language, which are only attainable by a native. No material changes have, however, been attempted by Dr Davies; on the contrary, he has implicitly adopted the American text, without attempting to follow the example set by MM. Togno and Durand, in inserting the discoveries which have been made since the publication of the former edition, or by the addition of any new matter of importance.

The alterations he has made, are inserting as parts of the original text, or perhaps what he claims as his new matter, all the accounts of American plants, and the notices and analyses of the principal American and English mineral waters, &c., which in the American edition were marked by brackets to point out what had been added by the American editors. Even the notes added and marked in the American copy " Am. Eds.," in the English edition have " Tr." affixed to them, as if they were original with Dr Davies; perhaps they mean *transferred* by him. He has, however, inserted in the table showing the proportion of pure alcohol contained in one hundred parts of the principal wines, &c., the relative strength of some of the home made wines.*

But notwithstanding the " numerous corrections" on which he prides himself, he has strangely overlooked some material errors made by the American translators, some of

* As far as we have been able to discover, the only really original matter furnished by the English editor, are his preface and four notes at pages 209, 245, 247 and 249, and six paragraphs on mineral waters, at pages 92 and 228, of a few lines each. If he inserted any thing else, it has escaped our observation.

which we will point out. Indeed we should almost be disposed to think that he had never seen the French text, or he would not have failed in detecting these errors. Thus, both English (page 10), and American (page 26), say, "Salts may be neutral although they contain a small excess either of acid or of base," whereas the authors say, "salts may either be neutral or may contain a small excess of acid or of base." Page 34, l. 49: "Carbonisation is an operation similar to calcination, but carried to a greater degree," whereas it should have been, "to a less degree." The English author has also made another of what we suppose he terms his corrections, in making cantharides a fruit instead of an insect, by changing its generic name of *meloe* to *melo*. We might multiply examples, but we trust that we have given sufficient to satisfy even the most sceptical. There is one alteration of the American text, however, which requires notice. In the article Wax Myrtle, page 336, Dr Davies has wholly misunderstood his subject, and by way of improvement has transposed the different paragraphs of the American edition in such a manner as totally to destroy their meaning. This article, which is original in the American edition, is included under the head of *Emetic Substances*, because it was first intended to speak only of the bark of the root of the *Myrica cerifera*, which is eminently endowed with emetic properties, and has been successfully used as a substitute for ipecacuanha. As the translators had obtained further information through Dr Fahnestock, respecting the powers of the wax as an anodyne astringent too late to include it under its proper head, it was mentioned when speaking of the plant itself; the English editor, from a wish of amending the arrangement, has made the wax the principal article, and yet has still retained it among the emetics; in making his fancied emendation, he has also committed an extraordinary blunder in saying, "the shrub which yields the myrtle and abounds in many parts of the United States." Besides the superfluity of the word "and" in this sentence,

it makes the shrub bear itself, instead of berries furnishing the wax.

But enough of this unpleasant duty, which we are bound to fulfil in vindication of the claims of two estimable and worthy fellow citizens, and to mark our sense of these wholesale literary plagiarisms. Every man has a right to make knowledge his own wherever he meets with it, and to give it to the world again in what garb he pleases, provided he gives due credit to the originators and authors of that knowledge.

We are glad to learn that the American editors intend shortly to publish a second edition of their work, in which the errors of the former will be carefully corrected, and great additions of new and interesting matter will be inserted, especially as relates to the recent discoveries of numerous simple bodies, and of new powers appertaining to those previously known, as fluorine, bromine, thorine, &c. They have also much improved the chemical nomenclature of the original authors, thus, using the terms carbonate of lead instead of sub carbonate, biborate of soda for sub borate, &c., &c.

ARTICLE XXXIX.—*The Edinburgh New Dispensatory, &c. By Andrew Duncan, M.D. Twelfth edition. Edinburgh,* 1830, *pp.* 1127.

The Edinburgh New Dispensatory, originally published by Dr William Lewis in the year 1754, was the first truly scientific work on pharmacy in the English language. Whoever compares the early editions with Quincy's Dispensatory, the most popular work extant at that time, will perceive its superiority. It is evident that Dr Lewis had studied the subject as fully as the very imperfect chemistry of that age

permitted, and that he wrote out his descriptions after close inspection of the drugs described. His work was not a mere compilation from other books, but a judicious and original composition, to the improvement and perfection of which he devoted himself with great zeal and success. "The manner in which the whole was executed," says Dr Duncan, "placed Dr Lewis at the head of the reformers of chemical pharmacy; for he contributed more than any of his predecessors to improve that science, both by the judicious criticism with which he combated the erroneous opinions then prevalent, and by the actual and important additions he made to that branch of our knowledge." Dr Lewis's Dispensatory became at once popular, and passed through many editions during his life, all of which received improvements from his hand. After his death the publication was continued by the booksellers under the care of Drs Webster, Duncan and Rotheram in succession. Since the year 1800 it has been superintended by the younger Dr Duncan, under whose name it retains its popularity and superiority, and has passed through twelve editions. The staple of the work is still Dr Lewis's, although the numerous additions and alterations required by the advance and change of science have rendered a great part of it entirely new. Dr Duncan deserves the thanks of the profession for the continued labour bestowed by him upon this work, and especially for the last edition, which is greatly improved upon its predecessors, and which we consider as by far the most accurate and learned Dispensatory in the language. These improvements are due to Dr Duncan's knowledge of the German and French authors, who are our masters in this science, and to whom we are indebted for almost all the discoveries and researches of which the last ten years have been so fruitful. Dr Duncan himself acknowledges as one of the circumstances which rendered a revision of the work necessary, the very valuable notes of Robiquet and Chereau to a French translation of his tenth edition. He has also incorporated into this edition the great improvements in the Dublin Pharmacopœia of 1826, and has

made free use of Dr Barker's commentary and translation of that work, and all the treatises on Pharmacy and Materia Medica which have recently appeared on the continent.

A compilation from these copious sources, performed with the skill and judgment for which Dr Duncan is distinguished, could not fail to prove highly interesting and valuable. Such a one was required by the profession, which had been compelled to resort to the writings of foreigners for the information required to keep them in advance with the improvements of the age. The superficial work of Dr Paris, and the highly valuable and respectable Dispensatory of Anthony Tod Thompson are both deficient in the particulars now spoken of, although the latter is superior to any former edition of Dr Duncan in most respects, and even to the present in the Botanical department.

The principal defect in the work before us appears to us to be in this department. It may be said, it is true, that the proper subject of a Dispensatory is the drugs themselves, and their properties as presented to the apothecary. Yet that knowledge can scarcely be considered as full and complete which does not embrace the character of the plant itself, so as to enable him to recognize it. Pharmacy now takes a wider range than it did in the days of Dr Lewis, and calls in to its aid all the collateral branches of natural history. In the German schools of Pharmacy, which are the models from which the English and Americans must copy, if they ever attain to distinction in this science, the study of all the collateral branches of natural history is insisted upon, and proficiency therein is made a requisite for admission to the privileges of the profession. This defect in Dr Duncan's plan may be exemplified by the article *Melissa officinalis*, which we take almost at random from the book.

Melissa Officinalis. Ed. Dub.

Willd. g. 1118; Spr. g. 2052, sp. 1. Didynamia Gymnospermia. Nat. Ord. Verticillatæ, Linn. Labiatæ, Juss. Balm.

Off. the Herb.

FOLIA, *Ed.* HERB, *Dub.*

Balm is a perennial herb which grows wild in the Alps and Pyrenees, and is frequently cultivated in our gardens. It has a pleasant smell like citron, and a weak roughish aromatic taste.

Med. use. It is principally used in the form of a watery infusion, which is drunk in the manner of tea.

In this description the student is supposed to be acquainted with the plant, or it is not thought to be worth while to tell him any thing respecting it. What is there in the above account of the plant which does not apply as well to the Verbena triphylla?

The article on the same plant from Dr Thompson will exemplify our views of the proper manner of writing a Dispensatory, and will show at once the superiority of his method.

"Melissa. Spec. Plant. Trilld. III. 146.

"Cl. 14. Ord. 1. Didynamia Gymnospermia. Nat. Ord. Verticillatæ, Linn. Labiatæ, Juss.

"G. 1118. Calyx dry, nearly flat above, with the upper lip subfastigiate. Corolla, upper lip somewhat arched, bifid; lower lip with the middle lobe cordate.

"Species 1. Melissa officinalis. Officinal or Common Balm. Med. Bot. 2d edit. 335, t. 119.

"Officinal. Melissa Officinalis. Folia, Edin. Balm leaves.

"Syn. Melisse (F.), Melisse (G.), Melissa (I.) Balsamina (S.).

"Balm is a perennial plant, a native of the south of Europe, growing in mountainous situations, and flowering from July to September. It is cultivated in our gardens. The root is fibrous, and sends up annual stems which rise about two feet high, and are branched, quadrangular and smooth. The leaves are opposite in pairs, of a bright green colour, ribbed, deeply serrated and cordate; the lower ones on long footstalks, and the upper nearly sessile. The flowers, which are in small axillary branches forming semi-whorls, stand on slender peduncles, at the base of which are small, oblong, notched, hairy bractes. The calyx is tubular and pentan-

gular; the upper lip tridentate; the lower shorter, and cut into two acute teeth. The corolla, which is tubular, of a yellowish white colour, with the upper lip shorter and notched, and the lower three-cleft, encloses the anthers: the seeds are four, ovate, and placed at the bottom of the calyx. For medicinal use the herb should be cut before it flowers.

"*Qualities.*—The recent plant has the agreeable odour of lemons, which is lost in drying, and an austere, slightly aromatic taste. In distillation with water, it yields a small portion only of a yellow essential oil, on which its odour depends. The watery infusion tastes rough; reddens slightly litmus paper; and affords with oxysulphate of iron a deep olive; with nitrate of silver a deep brown, and with acetate of lead a copious greenish white precipitate.

"*Medical properties and uses.*—Balm is stimulant, stomachic, and diuretic. It was formerly prized as a corroborant in nervous affections; but it is now used only in infusion, as a diluent in fevers."

The mere reference to botanical authorities, which are not easily accessible, is worth but little to the apothecary, compared with the value of a full and clear description in plain language of the plant itself. In reference to the indigenous plants of his country, this full description appears to us to be indispensable, and in regard to the exotic officinals, to be of great value and interest.

If Dr Duncan must yield the palm to the London Dispensatory in this respect, he may claim the merit of having embodied into his present edition the recent researches of the continental writers respecting the origin and qualities of drugs, and much more accurate and copious criticism in the chemical department than is to be found in the work of Dr Thompson. We shall proceed to lay before our readers such passages from the work as will be new and interesting, and convey an idea of the great value of the present edition.

Under the head of Gum Arabic we are told,

"Hayne, in his tenth volume, has described the gum trees more accurately than his predecessors, having derived much information on this subject from Ehrenberg. Gum is produced by various species of *Acacia*, viz. *Gummifera*, *Ehrenbergiana*, *Senegal*, *Seyal*, *Arabica*, *tortilis*, *Karroo* and *vera*. Ehren-

berg saw the Bedouins engaged in gathering the gum in Egypt; that got from *A. Ehrenbergiana*, they called *Samle;* that from *A. Seyal*, was *Sejal;* and that from *A. tortilis*, they call *Aohle*. He also remarked, that different kinds of gum are got from the same species. The juice flows out from the tree sometimes as if frothy, sometimes dense, and clear or dark in colour, and the masses in which it concretes are of different forms and sizes. Hence it happens, that the kinds which occur in commerce are not always got from particular species, but that, wherever gum is collected, it must be sorted to form the different kinds found in commerce.

"Dr Roxburgh has described the *Mimosa Arabica* of Bengal as capable of furnishing employment to the natives in collecting its gum; but it would appear that the greater part of the East Indian gum is obtained from the *Feronia Elephantum*.

"There occurs also occasionally an insoluble gum, resembling Gum Senegal. It is at once known by putting a piece into the mouth. It does not adhere to the teeth, but swells and feels elastic under the teeth.

"In the Parisian Pharmacopœia there are two varieties of Gum Arabic admitted: *Gummi Thuræi*, which, by comparison, I find to correspond with our picked, and *Gummi Jaddæ* with our common gum. Their *Gummi Senegalense* resembles our gum of the same name.

"According to Hayne there are four kinds of gum in commerce: 1. *Gum Arabic*, in whitish round masses, full of fissures, very crumbly, which is said to exude as a frothy juice. 2. *Barbary gum*, in small, compact, commonly longish pieces, yellowish, or more or less brown, often almost transparent, and tolerably brittle. 3. *Gum Gedda*, larger, commonly round pieces, of a brownish red, and less brittle. These three kinds all come through the ports on the Mediterranean sea. 4. *Gum Senegal*, in large roundish pieces, of whitish, yellow, or reddish colour, very difficultly broken, and large conchoidal fracture."

"*Ammomum Cardamomum.*

"The confusion which at present subsists in regard to the shrub producing this spicy seed, it is to be hoped, is now likely to cease, since the publication of Dr Roxburgh's classical *Flora Indica*, in which it is referred to the *Alpinia Cardamomum, g.* 15, *sp.* 1. He has been already followed by Sprengel and the Berlin Pharmacopœia. The names given by the London and Edinburgh Colleges are synonymes of the true plant; but the *Ammomum Cardamomum* of the Dublin furnishes a spurious, and not the true, cardamom.

"The notes to Roxburgh's botanical description contain some curious information on the subject. The plant is a native of the mountainous part of the coast of Malabar. The root is tuberous, and the stem perennial. The capsules are oval, size of a small nutmeg, three celled, three sided; the seeds many and angular.

"The seeds, it is asserted, never germinate, and the plant is propagated only by cuttings, or in the following manner. Before the commencement of the periodical rains, the cultivators of the cardamom ascend the coldest and most shady side of a woody mountain. A tree of uncommon size and weight is there sought after, the adjacent ground is cleared of weeds, and the tree felled close at the root. In about a month's time young cardamom plants appear. The natives

attribute no other effects to the fallen tree, which may be selected from any species, than such as are derived from its weight and strength, added to the shade which its branches afford to the young plant. The shrub continues to grow in this manner until nearly after the early rain of the fourth year in February, when it has reached its utmost height, which varies from 6 to 9 feet. Four or five tendrils, called the threads, now spring from its stem, near the root, and afterwards the fruit is produced, which is gathered in November, and dried in the sun. The fruit is annually collected until the seventh year, when it is usual to cut the plant down, and from the trunk sprouts arise in the next monsoon, which grow, flourish, and are cultivated as before. This article yields to the Indian government from 25 to 30,000 rupees *per annum*."

The article on *amylum* conveys a clear account of the late researches of chemists into its varieties, which, though not altogether new, will, we think, be interesting to our readers.

"Starch is not absolutely identical as obtained from different vegetables. M. Caventou made some interesting observations on amylaceous substances. Wheat starch, their prototype, is totally insoluble in cold water; but from various causes it may be so modified as to become more or less soluble. Saussure described the effect produced in a mixture of starch and water left together to undergo the process of spontaneous decomposition. They formed a paste, which by analysis was found to contain sugar 47.4; gum 23; modified starch 8.9; starch 4, amylaceous lignin 10.3 = 93.6. To the modified starch he gave the name of *Amidine*. But Caventou proved, that fermentation is not necessary to its production; for unfermented starch experiences the same modifications when it is boiled with water, or heated until it becomes of a pale brown colour (British gum), or treated with dilute sulphuric acid. The characters of amidine are, solubility in cold water, being precipitated by tincture of galls and by acetate of lead, and not forming a jelly on cooling after being concentrated. The arrow-root (*Maranta arundinacea*) of the West Indies, and potato starch, in the preparation of which also no heat is employed, agree with raw wheat starch in all respects. But sago (*Sagus farinifera*), and tapioca (*Jatropha manihot*), are not varieties of starch but of amidine. They must, however, have been extracted from the plants in the form of starch, as they are got by washing with cold water; but the modification is afterwards effected by the heat employed in the process of drying or by slight torrefaction. Salep (*Orchis mascula*) is not an amylaceous substance, but analogous to gum tragacanth, containing a large proportion of bassorine.

"M. Villars of Strasborough published a very curious essay on the structure of the potato, as seen by the microscope. He found the starch (farine) of potatoes formed of ovoid globules from 1-100th to 1-50th of a line in diameter. Those of wheat starch were about one-third of the size, varying from 1-250th to 1-100th. Those of potato were smooth, brilliant, and milky, like globules of mercury. When bruised upon a glass, they were reduced into square or irregular fragments, but still smooth. By boiling they were enlarged about a third, but seemed cracked on the surface. When viewed in a thin slice of frozen po-

tato, they were seen disposed in contiguous groups in the meshes of a network of fibre, but not adhering to them. Wheat starch is less easily altered by heat than potato starch; it contains less water, which it parts with and recovers less readily. Therefore potato bread does not keep fresh above two or three days; wheat bread keeps from four to eight; and rye bread at least fifteen or twenty, or even a month, especially if the bran be not separated.

"MM. Raspail and Dumas have since published some very remarkable microscopic observations on the structure and different forms and size of the varieties of fæcula.

"M. Planche having observed the remarkable lightness of some starch prepared by him from the root of the black radish, conceived that a comparison of the weight of equal volumes might serve to distinguish the fæcula of different vegetables. According to him, the specific gravity of flour starch to potato starch was as 62 to 84; and this difference seemed not unimportant in pharmacy, as the former serves admirably to suspend camphor, for which the latter is unfit. This led MM. Payen and Chevallier to institute some experiments, from which it may be concluded, that the specific gravity of all starches is the same, 1530; and that the difference of the weight of the same volume, when dry, is owing to the particular minuteness of their grains.

"In this country the finest starch is obtained from wheat flour, but it is also procured of very fine quality from the potato. In the West Indies what is called Arrow root, is prepared from the roots of the *Maranda arundinacea;* and a similar substance is got in the East Indies from various species of *Curcuma.* Other kinds of fæculæ are more or less altered by the process followed in preparing them. What is commonly sold as arrow root is nothing but potato starch. In fact, it is sold for less than genuine arrow root costs in the West Indies. Nor does any harm arise from the substitution; for, so far as my experiments go, I can find no chemical difference between them, although many modes of distinguishing the genuine from the spurious are from time to time published in periodical works."

The description of the solid camphor of Borneo will be new to the English reader.

"The most minute description of the solid camphor of Borneo is given by Dörrffurt and Schwartze, taken from John Crawford of Demerary,—an authority I have not been able to trace. It is said to be stronger than laurel camphor, and more fixed; to be opaque, of a chalk-white colour, friable between the fingers, of a not unpleasant taste, first cooling and then heating, and emitting, when refined, a distinct violet smell; and that a small portion is soluble in water, and the rest consists of pure volatile oil. The specimen examined by me does not altogether coincide with this description. It occurs in tabular plates somewhat translucent. It is easily pulverizable without the addition of alcohol, and the powder does not agglutinate on standing, whereas that of laurel camphor does. It is evidently more compact than common camphor, emitting a ringing sound when the bottle containing it is shaken. Its specific gravity is hardly less than that of water; some portions even sink. It does not at all sublime spontaneously, nor does it form crystals in the upper part of the bottle in which it is kept. When boiled with water its smell is disseminated, and it

wastes. Its other characters do not differ from those of common camphor. From the same tree is also obtained, in considerable quantity, a limpid fluid. The fluid camphor is transparent, of a pale yellowish colour, smelling like a solution of camphor in oil of turpentine, and of a bitter turpentine taste. To the touch it is slightly viscid, and has not the harshness of oil of turpentine. Its specific gravity at 60° is 887. Exposed to the air on a watch-glass, it was reduced, after standing a month, to one-tenth of its original weight, became a clammy transparent homogeneous fluid, of a very pale brown colour, and resembling in smell as well as consistence Canada balsam, but without any odour of camphor. This residuum seemed to be soluble in ether, and partially in cold alcohol, but on the application of heat it was totally dissolved. Fluid camphor, when agitated with water, formed a whey-coloured mixture, which gradually separated into a transparent supernatant portion, and a milky inferior fluid, but not nearly so quickly as oil of turpentine and water separate. Its distillation with water is liable to the same difficulty as the distillation of oil of turpentine, from the explosions, which blow over into the neck of the retort a part of the mixture; but in the receiver I got a watery fluid, with some oil, and a white opaque pellicle like camphor. The liquor in the retort gradually acquired a gelatinous appearance, and, on standing, was found to consist of a watery fluid, and abundant white curdy-like substance, which floated in the fluid. For specimens of both solid and fluid camphor of Borneo, I am indebted to John Crawford, Esq. resident at Sincapore."

Under the head of *Papaver* it is remarked:

"The best accounts of the production of the East India opium are by Mr Kerr and Mr Howison. The very great inferiority of the Indian to the Persian opium is gradually diminishing. By some European gentlemen in Bengal, opium is now prepared in every respect equal to the best of Persia. On this point I can speak with certainty, having received two considerable samples from Dr Adam of Calcutta, and made frequent comparative trials of its power in hospital practice. Its tincture is darker coloured than that of Turkey opium.

"Notwithstanding the successful trials of procuring British opium, especially by Mr Young, I am perfectly satisfied that any attempt to obtain opium in quantity will end in disappointment. The want of heat and the high price of labour on the one hand, and stormy winds and violent rains on the other, are insuperable objections to the culture of the poppy in Britain as a branch of agriculture."

"*Pterocarpus Draco.*

"This is also a very large tree. It is a native of South America. Hayne says, that although the resin of the *Pt. draco* was formerly sent in abundance from Carthagena to Spain, it no longer occurs in commerce, on account of the decreased demand for dragon's blood, and that the dragon's blood of commerce comes chiefly from the *Calamus draco* of the East Indies, and also from *C. verus* and *C. rudentum*. It is obtained from their fruit, which, when fully ripe, is covered with a crust of a red resinous substance. This is separated by stamping them gently in a mill, or shaking them in a sac, and is then formed by the assistance of heat into balls about the size of a nutmeg; or it may be got by steaming and boiling the fruit in water. The balls are put up in the cases woven

of the leaves of the *Licuala spinosa*, and the most esteemed are the *S. D. in guttis*. It also occurs in cylindrical rolls, put up in the same manner. A second sort is in larger or smaller fragments, and is called *S. D. in granis*, and is often finer and better than the preceding. A third sort, *in placentis*, in cakes of several ounces weight, is got by boiling the bruised fruit after the former kinds have been separated; and a fourth, *in tabulis*, is a sophisticated mixture of colophony, powdered red saunders, with a little true dragon's blood.

"This drug, in substance, has no sensible smell or taste; when dissolved, it discovers some degree of warmth and pungency. It is fusible and inflammable, and almost totally soluble in alcohol, tinging a large quantity of the menstruum of a deep red colour. It is likewise soluble in expressed oils, and gives them a red hue, less beautiful than that communicated by Anchusa. It is not acted upon by water, but precipitated by it from its alcoholic solution. I found that it is soluble in nitrous acid and alkalies, and that it neither precipitates gelatine, nor affects the colour of the salts of iron. It therefore appears to be a pure resin, without any astringency. The same conclusion has since been made by Melandri, by whom dragon's blood has been lately analyzed, and found to consist chiefly of a new alkaloid, which he has named *Draconine*. He prepares it by decomposing the tincture by water acidulated with sulphuric acid, and washing well with water the precipitate, which is sulphate of draconine. This is a red uncrystallizable mass, very sparingly soluble in water, more soluble in alcohol, and easily decomposed by alkalies. It melts in a gentle heat, and when decomposed seems to contain no nitrogen. *Sanguis draconis in placentis* consisted almost entirely of draconine, but that *in guttis* or *lachrymis* contained little."

"*Ricinus Communis.*

"This beautiful plant grows in both Indies, Africa, Greece, the Levant, and the south of Europe. In tropical climates it survives several years. Richard saw, near Nice, a small wood consisting entirely of arborescent Palma Christi, but in Europe it is in general annual. There is but one species of this plant. Dr F. Hamilton found, however, four varieties very commonly cultivated in India. Two of them (*R. communis* and *R. lividus*, Willd.), are almost always cultivated for seed, and they are, therefore, sown close, so as to stint their growth, and thus bring them early to flower; and when they have ripened their seed, they are destroyed by the plough, a new sowing being more productive than if they were allowed to grow for several years. The other two varieties (*R. viridis* and *R. Africanus*, Willd.) are chiefly cultivated for their leaves, on which a large kind of silk-worm is reared for spinning a coarse silk. On this account they are usually planted in hedges round the huts of those who rear the worms, and, being allowed to stand for years, acquire a considerable size."

"Castor oil is sometimes extremely acrid. It has been a question of great interest among the French and German pharmaceutists to determine the cause of this occasional acrimony of castor oil, some ascribing it to the embryo, others to the shell or husk, and others to the employment of heat in its preparation. The first is the ancient opinion, and is maintained of other seeds of the same natural family. Thus Jussieu mentions it of the seeds of the *Hura crepitans;* and I have been told that its embryo swallowed alone purges drastically, while the seeds from which the embryo has been removed may be eaten as freely as al-

monds. Bourtron-Charlard and Henry found that the *episperm* of the castor oil seeds possessed no acrimony, that the *embryo* alone yielded a mild oil, with an agreeable taste resembling green coffee, while the oil obtained from the *perisperm* or *albumen* alone becomes acrid, if too much heat be used in extracting it.

"M. Guibourt has examined the point with great attention, and has come to the following conclusions. The shell of the castor oil nut does not contain any acrid principle, and can only render the oil coloured without imparting to it any bad quality. The taste of the embryo is only a little more acrid than that of the perisperm, and it cannot be said that it is the only or principal seat of its acrimony. The perisperm contains both the oily and the acrid principle. This acrid principle is volatile; water in the state of ebullition expels it from the oil, and by boiling it is possible to obtain an oil perfectly bland and little coloured. Too great a degree of heat, or heat too long continued, alters the nature of the oily principle itself, which acquires thereby a more or less deep colour, and an acrimony which should be considered to render it unfit for use."

We have not space to enlarge much upon the chemical department.

The following observations on the preparation of Liquor Potassæ Causticæ are valuable.

"On this process several remarks occur. The proportion of lime to the alkaline salt prescribed by the College is very different. With six parts of the salt the Edinburgh use eight, the Dublin six, and the London only three. According to the atomic scale of equivalents, 28 parts of lime are sufficient to decompose 70 of potashes; but Dr Barker found, by experiment, that a less proportion of lime than five-sixths of the weight of the alkaline salt was insufficient for the purpose. The most obvious inconvenience arising from using an excess of lime is the bulk of the residuum, which requires the employment of larger vessels than otherwise would be necessary; and the spongy nature of the residuum, which retains a considerable portion of the solution. This inconvenience is, however, in a great measure, obviated by pouring on an additional quantity of water, as directed by the Edinburgh College.

"The Colleges also differ in the proportion of water they employ. With twelve parts of alkaline salt the Edinburgh College uses 56 of water, the Dublin 90, and the London 120. At first consideration, this difference might only seem to affect the strength of the alkaline solution obtained; but it appears, from the experiments of Dr Barker, that with a less proportion of water than that ordered by the Dublin College, the alkali cannot be totally deprived of its carbonic acid.

"From the sparing solubility of lime in water, and the total insolubility of its carbonate, its full operation does not take place immediately, or without assistance. On this account the Dublin College direct the mixture to be frequently agitated, during three days, in a well stopped bottle.

"The Colleges differ also in the manner of separating the solution from the residuum. The Dublin College decant off the ley; the other Colleges filter it.

"From the weight and density of the carbonate of lime, it is easy to pour off the greater part of the caustic ley; and as it is in this way exposed, for a very

short time, to the action of the air, it does not absorb from it any notable quantity of carbonic acid, and is therefore very caustic. The only objection is the waste of the portion retained among the particles of the residuum; but this may be procured by filtration. The London and Edinburgh Colleges prescribe filtration. The objection to this method is, that, as commonly performed, it brings the caustic solution too much in contact with the atmosphere. Mr Donovan invented a method by which this was, in a great measure, prevented; but as his apparatus seemed to me to be difficult of execution, and liable to be broke, I attempted a modification of it which I find to answer perfectly. It consists of a funnel, through the throat of which a tube is passed, fitting it only loosely. Around the tube a bit of linen or cotton rag is wound, so as to make it fit the throat of the funnel; and over this a small quantity of very fine and well-washed sand is put, and then coarser sand to keep it steady. The tube is adjusted so as to rise up almost to the level of the upper surface of the funnel. The throat of the funnel fits closely a phial to receive the filtered liquor, and the surface is covered by a glass plate. By this arrangement, while the fluid drops into the phial below, the air it displaces rises through the tube into the upper part of the funnel, and thus the fluid comes in contact with that small quantity of air only which the phial originally contained.

"If the solution of potass be pure, it will be clear, without colour or smell, feel soapy, and will neither effervesce with acids, nor form a precipitate with subcarbonate of potass. If it effervesces, carbonic acid is present, and must be separated by again shaking the solution with a little lime, or by dropping it into lime water, as long as it produces any precipitate. But Mr Phillips has remarked, that even when a small quantity of carbonic acid is contained in it, no precipitate is produced, unless a considerable quantity of lime-water be added; and in his late translation of the London Pharmacopœia, he says, it is in vain to expect to preserve it so perfect, that lime-water shall occasion no precipitation. If, on the contrary, it contain lime, from too much of it having been employed in the preparation, it may be separated by dropping into the ley a solution of the subcarbonate of potass. When we have thus purified our solution of potass, it must be again filtered, to have it perfectly pure. It is necessary to keep the solution of caustic potass in phials of green glass; for it acts chemically upon those of white glass, and very soon destroys them. The phials should also be of small size, so that they may not be frequently opened."

(To be continued.)

MISCELLANY.

Plant affording the Gum Ammoniac.—The products of the umbelliferous plants are not yet properly referred to the species from which they are derived, in a vast number of cases; thus it is doubtful whether the galbanum is produced by the *Bubon galbanum*, as is generally supposed. The origin of the true sagapenum is unknown, although botanists have thought that it was furnished by the *Ferula Persica*, Willd. But it appears that this plant rather affords a kind of assafœtida.

The plant of the gum ammoniac has hitherto remained unknown, although seeds have been obtained which produced a species of *Heracleum*, not however affording the true gum. Jackson, in his Essay on Morocco, observed that the *fashook* of that country was a *Ferula* exuding gum ammoniac, but it is in fact the *F. orientalis* of Tournefort and Sprengel, and does not afford it.

Finally, colonel Wright has recently stated that the true plant furnishing this gum resin abounds in Persia and other districts, and that the gum is obtained by incisions. It is an umbelliferous plant, belonging to the family of the *Peucedaneæ*, but constituting a new genus, near *Ferula*. David Don, who has carefully examined it, has called it *Dorema ammoniacum*, and his description of it will appear in the next volume of the Trans. Lin. Soc. of London.—*Virey, Journ. de Pharm., April* 1831.

Dragon's Blood.—M. E. Herberger of Munich has ascertained that this substance is composed of

Fatty matter	2.00
Oxalate of lime	1.60
Phosphate	3.70
Benzoic acid	3.00
Draconine	90.70
	100

It is well known, he adds, that M. Melandri has announced the presence of an alkaloid in this resin which he terms draconine. I am, however, convinced of the non-existence of this basal principle; I procured it in a state of purity; and found that it possessed sub-acid properties, which has induced me to class it with the sub-acids, with tannin, &c.—*Ibid.*

Purple Powder of Cassius.—Fisher prefers the proto-nitrate of tin in preparing this article, to any of the other salts of that metal, and more especially to the hydro-

chlorate. In fact the proto-nitrate gives a beautiful purple precipitate, whatever may be the concentration of the solution of gold. The hydrochlorate only produces this result when the solution is diluted to a certain degree.—*Ibid. from Schweigg-seidel's Journ.*

Observations on Salicine, and on its conversion into a colouring principle of a peculiar nature. By M. Henry Braconnot.—I have already stated that concentrated sulphuric acid, when placed in contact with salicine, immediately decomposes it; affording a reddish purple fluid. Yet it is by this very mode that M. Peschier still pretends to obtain sulphate of salicine. I must avow that it is impossible for me to agree with this gentleman in any respect. He says for example, that concentrated sulphuric acid gives the salicine a vivid red colour the moment it comes in contact with it, which colour changes to wine or even to dull red, if the acid be in too great quantity.

I filled a small ground stopper vial with concentrated sulphuric acid, to which I added a small quantity of salicine: on shaking the bottle, the colour was at first feeble, but as the salicine dissolved became of a very bright red, which was not changed by time.

By exposing the solution to the action of the air in a flat vessel, the sulphuric acid, in attracting moisture, gradually deposited the red colouring matter, whilst it will remain in solution on the addition of much water, or even when the acid is saturated with an alkali; but if, on the contrary, the acid be only weakened with its own weight of water, and then saturated with carbonate of potass in powder, a precipitate of sulphate of potass, united to the colouring matter, is formed, of a red approaching rust colour. Boiling alcohol appeared to have little action on this saline deposit, but in afterwards treating it with a sufficient quantity of warm water to dissolve the sulphate of potass, the colouring matter remained in such a state of division in the fluid that it appeared in solution, yet it was readily separated by filtration. When well washed it appeared of a liver red, approaching rust colour.

It was tasteless. Neither water nor alcohol had any appreciable action on it. When a mineral acid was added to it, its dull colour immediately changed to a bright red, it became more coherent and rapidly precipitated. It was insoluble in boiling concentrated acetic acid, which scarcely altered its colour. When treated with boiling nitric acid, it was dissolved and produced carbazotic acid.

The most feeble alkalies communicated a beautiful deep violet colour to this substance; but it was wholly insoluble in boiling caustic potass, and its violet colour remained unaltered; on the addition of an acid it resumed the bright red tint.

When dried, it was in fragile masses of a black colour verging on brown. In this state concentrated sulphuric acid gave it a bright red tint, but did not dissolve it. When exposed to heat, it exhaled a slight empyreumatic odour, and left a large mass of charcoal. This colouring matter having appeared to me to present sufficiently striking characters to merit a name, I propose to call it *Rutiline.*—*Journ. de Pharm.*

Acetification of Alcohol.—At a sitting of the French Academy of Sciences, held December 13th, 1830, M. Serullas announced to the meeting that he had just discovered that when bromic acid is poured on alcohol, vapours of bromine are seen immediately to be evolved, and at the same moment a strong smell of acetic acid is manifested. The chloric and iodic acids act exactly in the same manner upon that liquid, with disengagement of chlorine or iodine, and generation of acetic acid. The acid thus produced is nearly equal in strength to radical vinegar. Mr S. intends to repeat his experiments upon this new process of acetification of alcohol,

which he thinks will throw a great light upon the nature of alcoholic liquors, and may, in its application to the arts, have very curious and interesting results.—*E. D.*

A new reagent for separating Soda from Potassa.—In chemical analyses, great difficulties are frequently encountered in separating soda from potassa. The hydrochlorate of platinum and tartaric acid are the reagents most generally employed for effecting this separation; but the process is slow and incomplete. Whilst prosecuting his researches upon perchloric acid, M. Serullas discovered that when this acid is added to a liquid containing in solution both potassa and soda, a precipitate of chlorate of potassa is instantly thrown down, whilst the chlorate of soda remains in solution. The salt of potassa is insoluble, and that of soda on the contrary is very soluble, even in alcohol. Thus the perchloric acid may be used not only for separating both alkalies from each other, but also for taking up from other acids the potassa they might retain in combination. *April 25th*, 1831.—*E. D.*

Bleaching of Shell lac and yellow Wax.—Kastner recommends the following process: Mix together three parts of carbonate of potassa, three parts of pulverized lime, and twenty-four parts of water; macerate for twenty-four hours in a close vessel and decant the clear liquor; add to this four parts of shell lac, and carry the liquor to the boiling temperature. When cooled, filter the red mass and dilute it in a quantity of water equal to four times its bulk, then add, gradually, some chloride of lime, until the whole is entirely discoloured. By the addition of diluted muriatic acid, the alkali is neutralized and the bleached lac precipitated; a small quantity of alcohol, with the assistance of a moderate heat, will remove the portions of chlorine that might have remained attached to it. In this condition the lac may be dissolved in alcohol, and will form a white varnish.

Yellow wax may be bleached by the same process.—*Arch. fur die ges Natur. E. D.*

Number of Druggists in Prussia in proportion to the population. In an interesting memoir by M. Julia Fontenelle he gives the following table.

Provinces.	*Inhabitants.*	*Druggists.*	
		1st class.	2d class.
Prussia	1,200,540	22	60
Western Prussia	772,577	25	42
Brandenberg, except Berlin	1,293,480	50	107
Pomerania	870,055	25	62
Berlin	223,520	29	
Silesia	2,365,949	71	86
Posen	1,051,137	26	52
Saxony	1,396,240	48	108
Westphalia	1,210,712	15	107
Rhenish provinces	2,168,053	56	175
	12,552,268	367	799

Journ. de Chimie Med.

On the application of the Sulphuret of Cadmium to dyeing.—From a paper by M. Laissaigne on this subject we extract the following:

This body, which was discovered by M. Stromeyer, may be fixed on silk, by impregnating this substance in the first instance with the chloride of cadmium, and afterwards placing it in a weak solution of hydro-sulphate of potass or soda. It is

easy to do this by keeping the silk plunged in a solution of the chloride of cadmium at a temperature of +50° to 60° for fifteen or twenty minutes, afterwards wringing it and putting it in a weak solution of the hydro-sulphate of potass at the ordinary temperature. As soon as it is immersed in this liquid, it assumes a golden yellow colour, from the production of the sulphuret of cadmium, which becomes intimately united to the substance of the silk. Different shades of colour may be produced by using different quantities of the sulphuret. The colours thus obtained are unalterable by the strongest light, by diluted acids or alkaline solutions.—*Journ. de Chim. Med.*

Red dye from Peru.—M. Virey states that certain seeds of a deep red colour have been brought from Quilca in Peru, which give a beautiful carmine coloured infusion. These seeds are acidulous, pyriform, angular, uncinate or a little curved. He is of opinion that they are derived from a species of *Malpighia*, probably the *M. tuberculata* of Jacquin. This shrub is a native of both the Caraccas and Peru; it is known in the latter country under the name of *moureila*. The carmine colour afforded by these seeds is not very permanent, but is exceedingly rich and brilliant at first.—*Journ. de Pharm.*

Jalap.—M. Desfontaines read a notice before the institute of France on two new species of Jalap.

These two jalaps, or rather the leaves and flowers of the vegetables which furnish them, were sent to M. Desfontaines by M. de Humboldt, in a box which had been transmitted from Oribaza by M. Ledanois, a druggist established in that city. The latter does not give any description of those jalaps; he merely states that they grow in the vicinity of Oribaza, in a temperate climate, and that they are capable of withstanding several degrees of frost. He also sent some seeds, which have been sown in the *Jardin du Roi*. One of these plants, known in the country under the name of *male jalap*, is, according to M. Ledanois, a very good purgative, and has not the acidity of the common jalap, and that he has always administered it with success. He also states that he had sent roots to M. Chevalier, for them to be analysed. M. Desfontaines has examined these two species of jalap; they belong to the genus *Convolvulus:* their leaves are heart-shaped, those of the male jalap are tomentose, those of the other smooth and terminated by a long point; their corolla is of the form and size of that of the *C. sepium*, and of a beautiful rose colour. The specimens sent are too imperfect to ascertain if these two plants have been described or known; but, he adds, that there is no doubt that they are different from the species cultivated in the Jardin du Roi (C. jalapa, Desfon.). This has a white corolla, a wrinkled leaf, and covered beneath with thick set down, characters which evidently distinguish it from the other species.—*Journ. Chim. Med. Feb.* 1831.

Action of the Salts of the Protoxide of Mercury on the solution of Gold.—From the experiments of professor Fischer of Breslaw, the salts of the protoxide of mercury form with the solution of gold, a compound analogous to the purple precipitate, produced by the mixture of this same solution with the proto-hydrochlorate of tin. When the proto-nitrate of mercury is added to a solution of gold, a grey-blue precipitate is obtained, the colour of which is more or less deep, according to the proportion of the salts. This precipitate is composed of the deutoxide of mercury and the sub-oxide of gold. The combination is as intimate as in the purple powder of Cassius; hydrochloric acid does not decompose it. This acid only dissolves a small portion of the mercury, and then the colour passes to a clear grayish white.—*Journ. de Pharm. March* 1831.

Action of Iodine on some Essential Oils.—M. Hashoff of Essen (Brande's Archiv.) states that the addition of a little iodine to a few drops of oil of juniper, produces a great elevation of temperature, with a disengagement of yellowish violet vapours. The residuum on cooling was fluid, of a yellow brown colour, and had the smell of the essential oil; its peculiar taste was also perceptible after it had stood for some time. When iodine was added to oil of savin a violet reaction took place, with great heat, and the disengagement of violet and yellow fumes; the residue was a resinous mass of a dark brown colour, with an empyreumatic smell. Oil of peppermint slowly dissolved the iodine, without any elevation of temperature. Its odour and taste remained unaltered. There was no reaction with the oil of rue, it merely became somewhat thicker, and assumed a brownish red colour. The oils of tansy, mint, parsley and caraway, likewise underwent no change, except that the former became of a beautiful brown red colour. When a small quantity of spirits of turpentine was added to those oils which were not altered by the iodine, a violent reaction took place, with disengagement of heat and copious fumes of a yellowish violet colour. Hence iodine is a good test of the purity of the above mentioned oils, which are often adulterated with spirits of turpentine.—*Journ. de Pharm.*

Remedy of the Hindoos for Cholera Morbus.—It is said that the *Bean of St Ignatius* (*Ignatia amara, L.*) is successfully employed in India against the Cholera Morbus. It is called *Calamba pepita* in the Philippine islands where it grows. An alcoholic tincture is made of it which is given in drops in some convenient vehicle, and sometimes with opium.—*Journ. de Pharm.*

On Hydrocyanic acid. By M. Henry, Jun.—The medicinal hydrocyanic acid is an article to which great attention should be paid by druggists, on account of the accidents it may occasion and the difference of its operation, if its composition be not identical. For the purpose of obviating these as much as possible, Magendie has ordered in his formulary, the preparation of this medicine, with the anhydrous acid of Gay Lussac, diluted with a known proportion of water. But the preparation of the anhydrous hydrocyanic acid always exposes the operator to some danger, and the product is often decomposed in a few days, without any apparent cause. Having remarked for some years past that the hydrocyanic acid obtained by the process of M. Gea Pessina was easily preserved, I endeavoured to ascertain the density of the medicinal prussic acid of Magendie, in order to reduce that of Pessina to the same standard, in order that it might be substituted for it in the practice of medicine.

For this purpose I prepared a certain quantity of hydrocyanic acid according to the process of Gay Lussac; this still retained some traces of water, and its density, instead of being 0.7058, was only 0.7210. Tested with one of the salts of silver it furnished a cyanuret, which, when washed and dried, weighed 4.081 for each gramme of the acid, the cyanuret being formed of

Silver, 1 atom	1351.607
Cyanogen, 2 atoms	329.911

It is evident that 100 of the cyanuret of silver contains 20.34 of anhydrous acid. The above acid therefore contained in each gramme 4.952 of anhydrous acid; that is, it was nearly pure. To 5 grammes of this, 42.5 of pure water was added, which formed an acid of the strength of that of Magendie's formulary. The density of this was 0.9843, and each gramme contained 0.19 of real anhydrous acid (nearly 4 grains). Hence by diluting the acid of Pessina with sufficient water to give it a density of 0.980 to 0.984, a medicine will be obtained precisely similar to that

ordered by Magendie, but much more readily made, and which can be preserved without alteration.—*Journ. de Pharm.*

Extraction of the gelatinous principle of Iceland moss.—M. Beral gives the following directions for making pure jelly from the Iceland moss.

Iceland moss washed clean in cold water	32 ounces
Water	16 pounds.

Boil this mixture for an hour, constantly stirring it, remove it from the fire, pour part of it into a horse hair sieve, placed over an earthen pot, and gradually press it in such a manner as to force the gelatinous part through the interstices of the sieve. Preserve the residuum, and treat the rest successively in the same manner. Boil the residuum in eight pounds of water and proceed as before. Then heat the whole of the gelatinous portions so as to render it quite fluid, and pass it through a thick muslin strainer. To this gelatinous liquid is to be added eight pounds of rectified alcohol; when the whole is cold again, pour it into a horse hair sieve and stir it constantly. Wash the gelatinous matter left on the sieve with four pounds of alcohol, again strain, and press it with the hand to separate as much of the alcohol as possible. The result will be an elastic mass composed of gelatine and alcohol, weighing about two pounds.

Two pounds of lichen thus treated will furnish thirty-two ounces of alcoholic gelatine, which are reduced to sixteen ounces by simple pressure, and to four ounces by drying in a stove. In the latter state this gelatine is hard, corneous, soluble with difficulty in boiling water, and hence cannot be used to make a jelly.

Sweetened gelatine of Iceland moss.—R. Alcoholic gelatine 2 lbs.
Refined sugar 4 lbs.

Mix well in a marble mortar, and dry by a gentle heat.

Jelly of Iceland moss.—R. Sweetened gelatine 4 oz.
Water 6 oz.

Boil till reduced to eight ounces; strain and flavour as may be deemed expedient. This can be made in ten minutes. It has no bitterness, is agreeable to the taste, and possesses all the properties of the lichen.—*Journ. de Pharm. June* 1831.

Anhydrous Crystals of Sulphate of Soda.—If a drop of a solution of sulphate of soda be placed upon a glass plate and allowed to evaporate spontaneously, it will leave crystals which may be distinguished by their form and ultimate efflorescence, as being the salt in question. Most of the potash and soda salts may be distinguished as to their base by such an experiment. They are easily converted into sulphates by a drop or two of sulphuric acid and ignition, and then, being dissolved and tried as before, will yield crystals which may be known by their forms, and more especially by their efflorescence, if of soda, and their unchangeable state, if of potash. This test is, however, liable in certain circumstances to uncertainty, arising from a curious cause. If the drop of solution on the glass be allowed to evaporate at common temperatures, then the efflorescence takes place and the distinction is so far perfect; but if the glass plate with the drop upon it be placed upon a warm part of a sand-bath or hot iron plate, or in any other situation of a certain temperature, considerably beneath the boiling point of the solution, the crystals which are left upon evaporation of the fluid, are smaller in quantity, more similar in appearance to sulphate of potash, and finally *do not* effloresce. Upon examining the cause of this difference, I found they were anhydrous, consequently incapable of effloresing.

Hence it would appear, that a mere difference in the temperature at which a solution of sulphate of soda is evaporated, will cause the formation of hydrated or anhydrous crystals at pleasure, and that, whether the quantity of the solution be large or small. This indeed might have been expected from that which takes place when hydrated crystals of sulphate of soda are carefully melted; a portion dissolves, and a portion separates, the latter in an anhydrous state. I find that, if it were desirable, crystallized anhydrous sulphate of soda might easily be prepared for the market; though as the pure salt is now but little used, it is not likely this condensed form will be required. Whenever a soda salt is to be distinguished from one of potash, in the manner above described, this effect of temperature must be carefully guarded against.—*Quarterly Journ. Sci. and Arts.*

On Gallic Acid. By M. Braconnot.—M. Braconnot had recommended the preparation of gallic acid by a process in which the tannin present in the infusion of galls was removed by gelatine; but M. Berzelius thought that such gallic acid was chemically combined with tannin, and that pure gallic acid could be obtained only by sublimation. M. Braconnot has therefore made further experiments, and finds that the two substances differ, and that, not from the presence of tannin in the unsublimed acid. The latter he calls pure gallic acid, and the other pyrogallic acid.

When very white gallic acid, giving no indication of tannin to gelatine, was moderately heated, it became a brown liquid, which crystallized on cooling, and which, dissolved in water, contained still gallic acid and a brown substance which precipitated gelatine abundantly. Thirty parts of dry white gallic acid, being subjected to a higher heat, gave only 3½ parts of sublimed gallic acid: though very white, its solution precipitated gelatine. The residue, when dissolved, gave a brown liquor, which became much deeper with persulphate of iron, and blue-black with protosulphate (these being characters of pyrogallic acid, and not of gallic acid); and it also abundantly precipitated gelatine. Hence, heat appears to rearrange the elements of gallic acid, so as to produce a peculiar variety of tannin and pyrogallic acid.

Pyrogallic acid reddens litmus paper, though less than gallic acid; it has a cool, bitter taste. It dissolves in 2½ parts of water, at 55° F., whilst gallic acid requires 100 parts at the same temperature. When re-sublimed, pyrogallic acid is decomposed almost entirely, producing tannin and charcoal. It dissolves in ether. Its aqueous solution is colourless, but by exposure to air becomes coloured, and deposits ulmin, being entirely decomposed in a few days if water be added as evaporation proceeds. Persulphate of iron added to it is immediately reduced to protosulphate, and a tannin matter is formed. Protosulphate of iron produces a blue-black liquor. These actions are very different from those of gallic acid, which with protosalts of iron produce no change, and with persalts produce a fine blue colour.

Pyrogallic acid slightly heated with strong sulphuric acid does not become coloured, and is not sensibly decomposed. Pure gallic acid treated in a similar way became coloured, but on adding water was found not much altered; no tannin was produced. Strong sulphuric acid and a higher temperature converted the gallic acid into ulmin; no tannin was formed.

Every endeavour to form gallic acid (upon Berzelius's views), by combining pyrogallic acid and tannin, failed. From all these facts, M. Braconnot concludes, 1. That gallic acid procured in the humid way, and cleansed by animal charcoal, is pure. 2. That heat converts it into tannin and pyrogallic acid. 3. That gallic acid cannot be produced from tannin and pyrogallic acid.—*Annales de Chimie*, xlvi. 206.

Fig 1

Fig. 2.

Fig. 3.

Drawn from Nature by W. P. C. Barton.

Tanner Vallance Kearny & Co Sc.

FRASERA WALTERI.

(American Columbo.)